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SITE CHARACTERIZATION REPORT FOR UNDERGROUND STORAGE TANK
ASSESSMENT BUILDING 5 NWS YORKTOWN VA
2/12/1992
VERSAR, INC.



**SITE CHARACTERIZATION REPORT
FOR THE
UNDERGROUND STORAGE TANK ASSESSMENT
BUILDING 5
YORKTOWN NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA**

Prepared for:

Naval Facilities Engineering Command
Norfolk, Virginia 23511-6287
Contract No. N62470-91-D-6653

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1.0 INTRODUCTION

1.1 Scope of Work

Versar, Inc., was retained by the U.S. Navy Atlantic Naval Facilities Engineering Command (LANTNAVFACENGCOM), referred to in this report as LANTDIV, to conduct a soil and ground-water survey within the vicinity of the underground storage tank (UST) adjacent to Building 5 at the U.S. Navy Yorktown Naval Weapons Station (NWS) at Yorktown (York County), Virginia.

The initial scope of work (SOW), dated July 19, 1991, which consisted of a total of seven monitoring wells and four soil borings was reduced to four monitoring wells and three soil borings prior to the start of field work. The scope of work was modified again in the field with the concurrence of the LANTDIV EIC (acting) John Kresky and the activity engineer, Jim Reeve on November 4, 1991. The purpose of the work was to assess potential contamination of the soil and shallow aquifer at the site caused by the subject UST and to evaluate data generated during a previous site assessment performed by ATEC, Inc.

The work performed under this contract included:

- Drill five soil test borings to depths of 20 feet, 45 feet, 47 feet, 42 feet and 43 feet below land surface (bls).
- Install one ground-water monitoring well on the downgradient side of the subject UST and between the two downgradient wells that had been installed to a depth of 15 feet (no water encountered) during a previous assessment. The well installed during this assessment was to a total depth of 57 feet bls.
- Collect soil samples from the five test borings and monitoring well boring to be analyzed for extractable organic halides (EOX), poly-chlorinated biphenyls (PCBs), toxicity characteristic leaching procedure (TCLP) metals and benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbons (TPHs). Field screening of soil samples was performed using a Microtip photoionization detector (PID).
- Collect water samples from the newly installed monitoring well to be analyzed for total petroleum hydrocarbons (TPH) and BTEX content.

- Perform slug tests on the aforementioned monitoring well to assess the hydraulic characteristics of the local shallow aquifer.
- Evaluate the chemical analytical results to assess the extent of contamination within the soil and shallow aquifer beneath the site.

Versar employed the services of ATEC, Inc. to install the test borings and monitoring well.

1.2 Site Description

Yorktown Naval Weapons Station is located approximately 10 miles east of the city of Williamsburg and immediately north of the town of Lackey in southeast Virginia. The subject site is situated approximately 0.5 mile north of the base entrance at Lackey (Figure 1.2.1). Building 5 is used as a fork lift training facility.

The subject UST was installed northwest of Building 5 in 1956. The 12,400-gallon steel tank was used to store heating oil and more recently, waste oil. The UST was taken out of service after failing a volumetric tank tightness test in December of 1990. According to base personnel, plans call for the removal of the tank in fiscal year 1992.

The subject site is bordered to the north by a paved parking area, to the west by a paved access road and railroad tracks, and to the west and south by Building 5.

1.3 Site Topographic Setting

Topographically, the project site is at an elevation of approximately 80 feet above mean sea level (msl). Topographic relief across the site is relatively slight, although steep-sided, deep ravines are located to the northwest of the project site (USGS, 1984). These ravines contain ephemeral streams that eventually drain into Roosevelt Pond to the north. Based on topographic map interpretation, surface water at the project site would appear to flow to the northwest toward the aforementioned ravines. However, human activities at the site, such as construction and grading, may have affected the natural surface water drainage (ATEC, 1991).

1.4 General Regional Geology and Hydrogeology

The Yorktown Naval Weapons Station is located within the coastal plain physiographic

province of Virginia, which is typically characterized by unconsolidated sediments of Lower Cretaceous and Recent Age. The unconsolidated sediments consist primarily of sand, silt, and clay transported by adjoining uplands. A small amount of gravel interbedded with the sand, a few beds of mollusk shells, and a small amount of limestone are present in this region (USGS, paper 2242). Underlying the sediments are igneous and metamorphic rocks typical of the Appalachian Piedmont.

The subject site is underlain by the Windsor Formation, which is at lower Pleistocene or Upper Pliocene Age, and forms the uppermost stratigraphic unit beneath the site. This formation is characterized by gray and yellow to reddish-brown sand, gravel, silt, and clay (Mixon & Others). The Windsor Formation is estimated to be approximately 35 to 45 feet thick beneath the subject site.

Underlying the Windsor Formation is the Yorktown Formation of Upper Tertiary Age. This unit is identified by silt sand, clay and shell beds. This formation out crops along the sides of the stream valleys and ravines in the area (ATEC, 1991).

The upper most aquifer at the site is referred to as the surficial aquifer and lies within the Windsor Formation but was not encountered during this investigation. The surficial aquifer is an unconfined aquifer and is usually separated from the lower Yorktown aquifer by an upper confining clay layer within the Yorktown Formation. The upper confining layer of the Yorktown Formation appears to be discontinuous in the location of the site, allowing the Yorktown aquifer to discharge into the surficial aquifer. The Yorktown aquifer and the surficial aquifer have the greatest potential to be impacted by a release of petroleum.

1.5 Previous Investigations

A site assessment was performed by ATEC in April 1991 and involved the installation of three monitoring wells (total depth of 15 feet bls) and the collection of soil samples for laboratory analysis. No ground-water samples were analyzed because the monitoring wells installed by ATEC were of insufficient depth (i.e., dry wells), and no constituent ground water was encountered to the explored depth. Results from one water sample were reported by ATEC; however, this sample appears not to have been from actual ground water at the site.

The data presented in the ATEC report show that field readings with a PID showed concentrations of between 1 and 75 parts per million (ppm) in monitoring well (MW) 1, 70 ppm in MW-2, and 2.5 ppm at 8 to 10 feet bls in MW-3.

Soil samples were collected during the ATEC investigation at each well location between 6 to 10 feet bls and 23 to 25 feet bls. The samples collected at 23 to 25 feet bls were reported to contain <10 ppm to 11 ppm TPH, while the samples collected at 6 to 10 feet bls were reported to contain 340 to 6,700 ppm TPH. It should be noted that a duplicate sample collected from MW-2 (4,000 ppm) was reported at 870 ppm TPH. The variance in these two results appears to indicate that proper field and/or lab quality control procedures were not followed.

One water sample was collected from MW-1 and was reported as containing 6.8 ppm TPH by ATEC. MW-1 which encountered water at 2.2 feet bls was the only ATEC monitoring well to encounter water. ATEC assumed in their report that the water in MW-1 was ground water.

ATEC concluded their report by recommending that the tank be removed and soil samples be collected for TPH analysis, and that the three monitoring wells be sampled after the tank removal and assessed for TPH content.

2.0 INVESTIGATIVE TECHNIQUES

2.1 Soil Borings

The first soil boring was performed to a depth of 20 feet bls as required by the original scope of work. Based on the information derived from this first boring, the scope of work was abridged and subsequent borings were drilled to the water table.

The soil borings were drilled with 8.25-inch OD hollow stem augers and sampled in general accordance with the LANTDIV SOW and ASTM Standard D-1586. Soil samples were collected at 0.0 to 1.5, 1.5 to 3.0, and 3.0 to 4.5-foot intervals, and thereafter at 5-foot centers using a 2-inch OD split-spoon sampler. During drilling, information concerning the substrate consistency was acquired at each sampling interval by recording the number of blows per six inches of penetration by the split-spoon sampler.

Each collected soil sample was first scanned with a Microtip PID and then visually classified prior to being placed in a designated plastic bag or precleaned glass jar. Geologic logs based on the aforementioned field information were produced for each soil boring and are included in Appendix A.

To minimize possible cross-contamination between the drilling and sampling of each boring, the augers, the down-hole sampling tools, and the back of the drill rig were cleaned with a high pressure steam cleaner at an established decontamination pad. In addition, the split-spoon samplers were cleaned between sampling intervals at the individual drilling locations by using non-phosphate detergent and a clean-water wash and rinse.

The auger cuttings from each borehole were containerized in designated 55-gallon steel drums that were labeled with the soil boring number and date of drilling. The 55-gallon drums were moved by ATEC to an area designated by site personnel for storage until proper disposal arrangements could be made.

2.2 Monitoring Well Installation

The 2-inch ID monitoring well was installed by inserting the PVC casing and screen inside the hollow stem auger. The monitoring well was constructed with a 15-foot length of schedule 40, 0.010-inch factory-slotted PVC screen with an adequate length of solid 2-inch ID PVC riser to reach above the existing ground level. The PVC screen and risers were joined together by flush-threaded couplings. The numbering system used at the site for well

identification was established beforehand as a result of the previous investigation. The well installed under this contract was numbered MW-4.

After the well screen and attached riser were installed, filter pack sand of medium grain size (known as torpedo sand) was poured down the center of the augers. The sand was allowed to fill the annular space between the well screen and the borehole wall, thus maintaining the borehole integrity. The filter sand was added until a level of two feet above the well screen was reached. A 1-foot thick bentonite seal was placed above the sand pack. The bentonite seal in the monitoring well was placed above the water table and was allowed to hydrate. The remainder of the annular space above the bentonite seal was filled with grout composed of neat cement.

The monitoring well was encased at the ground surface in a 5-foot by 5-foot by 6-inch thick concrete pad. The PVC well casing was cut to approximately two feet above existing grade and covered with a protective steel casing with a locking cap. Four, 3-inch by 5-foot protective steel bollards filled with concrete were then spaced around the well and set a minimum of 2.5 feet below the top of the concrete pad. A completed well construction diagram is included in Appendix A.

After installation, the monitoring well was developed to remove fine grained detrital material that may have been introduced into the well screen during well construction activities. The well development was performed using a low yield pump with a clean, dedicated PVC hose. Development continued until the ground water removed from the monitoring well was visually free of suspended particles. The removed ground water was containerized in designated 55-gallon steel drums that were labeled with the soil boring number and date. The drums were then moved by ATEC to an area designated by site personnel for future storage until proper disposal arrangements could be made.

2.3 Aquifer Testing

The purpose of this aquifer test study was to assess the hydraulic characteristics (hydraulic conductivity and transmissivity) of the shallow ground-water system within the vicinity of the site by analyzing the response to induced changes in ground-water levels. Such information was obtained by performing a slug permeability test on the monitoring well. The purpose of characterizing the aquifer was to acquire the necessary background information needed for the proper selection and design of potential ground-water remediation systems for the subject site.

The slug test was used to record the changes in the static water table in response to an instantaneous induced increase or decrease in water level. Slug tests provide information over a short time frame and a small area of the test aquifer (i.e., the immediate vicinity of the tested well). Data from a number of slug tests that are performed in wells areally distributed across a test aquifer can be averaged to assess a greater area of the test aquifer. For this study, the water-level readings from the slug test were used, along with an aquifer test software package, to calculate the hydraulic characteristics necessary for use in any future proposed remedial design. Background information concerning the well construction and associated boring logs for the well involved in the aquifer test can be found in Appendix A of this report.

2.3.1 Slug Tests

Falling and rising head slug tests were performed on MW-4. Slug tests are specifically designed to record and analyze the recovery rate of a well to an instantaneously applied rise or fall in water level. The slug creates an instantaneous rise in head when lowered into the test well or a corresponding drop in head when it is withdrawn from the well. The change in head gradually increases or decreases until the water level in the well reaches the pre-test equilibrium level. The rate of recovery for the water level in the well is controlled by the transmissivity and hydraulic conductivity of the tested aquifer. It must be noted, however, that an individual slug test applies only to a restricted area, in that, only the area within the immediate vicinity of each tested well is evaluated. Thus, testing several wells at a given site increases the applicability and representativeness of the slug test results.

2.3.2 Set-Up

The water level in the test well was monitored using the Hermit SE1000B data logger and a 10-psi pressure transducer. The data logger was set to collect data logarithmically, for the duration of each test and was set up according to the manufacturers recommendations for the type of test being performed. The Hermit data collection schedule was logarithmic for the first 45 minutes and linear at a rate of one data point every 10 minutes from then on. The logarithmic collection rate used by the Hermit data logger was as follows:

<u>Cycle</u>	<u>Time Interval</u>	<u>Sample Frequency</u>
1	0-2 sec	0.2 sec
2	2-20 sec	1 sec
3	20-120 sec	5 sec

<u>Cycle</u>	<u>Time Interval</u>	<u>Sample Frequency</u>
4	2-10 min	0.5 min
5	10-100 min	2 min
6	100-1,000 min	10 min
7	1,000-10,000 min	100 min
8	>10,000 min	500 min

Water levels in the slug test well were measured with the automatic data logger, recorded, and then computer plotted to provide an indication of the rate of recovery of the test well.

The test slug consisted of gravel or sand-filled 1.5-inch diameter polyvinyl chloride (PVC) pipe sealed at both ends. The slug was attached to a length of nylon rope to allow for lowering and raising within the test well.

2.3.3 Operation

For the slug test, the data logger was started and the slug was then rapidly lowered into the test well. The water levels were recorded at a logarithmic rate to assess the changes that rapidly take place at the start of the test. The slug was lowered to a point below the pre-test, equilibrium water-table elevation and the attached rope was secured at the top of the well casing until the water level reached a second equilibrium level. At that time, the data logger was stepped and the slug was then swiftly withdrawn. The subsequent water-level changes were recorded until the water level again reached the original equilibrium elevation.

2.3.4 Data Collection and Handling

The data collected in the data logger was downloaded to a laptop personal computer (PC) and stored on floppy disks and backup floppy disks. The data was then imported into a spreadsheet software package (Quattro) and arranged in tabular format for processing. Preliminary data assessment indicated that all of the data had been collected properly.

2.3.5 Data Analysis

Data collected in the field were compiled into an acceptable format for presentation, plotting and processing and then were evaluated with the AQTESOLV aquifer test software package (Geraghty and Miller, 1990). The rising and falling head slug test data were evaluated using the method of Bouwer and Rice (1976).

The AQTESOLV program allows the user to import spreadsheet data and then evaluate the data with a variety of methods and approaches. In addition, the matching of the data curves to the theoretical type curve is accomplished through the program's least squares estimation technique or through manual curve-matching. The manual curve-matching is preferred, in that it allows the user to eliminate that part of the early data that may be directly related to the test well hydraulics as opposed to the hydraulic characteristics of the tested aquifer.

The equations and assumptions used in the evaluation of the data from the slug tests are presented in both Figures 2.3.5 and 2.3.6.

2.4 Survey

Hoggard and Eure Associates established vertical and horizontal coordinates on the monitoring well installed under this contract as well as the existing monitoring wells. The elevation of each monitoring well was established at the top of the PVC casing. Figure 2.5.1 presents the results of the survey.

2.5 Sample Protocol and Analysis

2.5.1 Soil

Split-spoon samples collected during the drilling of the soil borings were scanned with a Microtip PID, visually classified for lithologic characteristics, and then placed in precleaned designated glass sample jars. The person handling the samples wore clean PVC gloves and transferred the soil samples to the designated jars by using either a decontaminated stainless steel scoop or by sliding the sample from the split-spoon sampler directly into the jar.

Soil samples for analysis were collected in the first 10 feet bls and in the 5 feet above the water table. At one of the sampling locations, a duplicate was collected. These samples were analyzed for EOX, PCBs, TCLP metals, BTEX, and TPH.

FIGURE 2.3.5 EQUATIONS AND ASSUMPTIONS

SLUG TEST METHOD FOR UNCONFINED AQUIFERS

REFERENCE: Bouwer, H. and R. C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

SOLUTION:

$$\ln s_o - \ln s_t = \frac{2 K L t}{r_c^2 \ln(r_o/r_w)}$$

where:

s_o = initial drawdown in well due to instantaneous removal of water from well [L]

s_t = drawdown in well at time t [L]

L = length of well screen [L]

r_c = radius of well casing [L]

$\ln(r_o/r_w)$ = empirical "shape factor" determined from tables provided in Bouwer and Rice (1976)

r_o = equivalent radius over which head loss occurs [L]

r_w = radius of well (including gravel pack) [L]

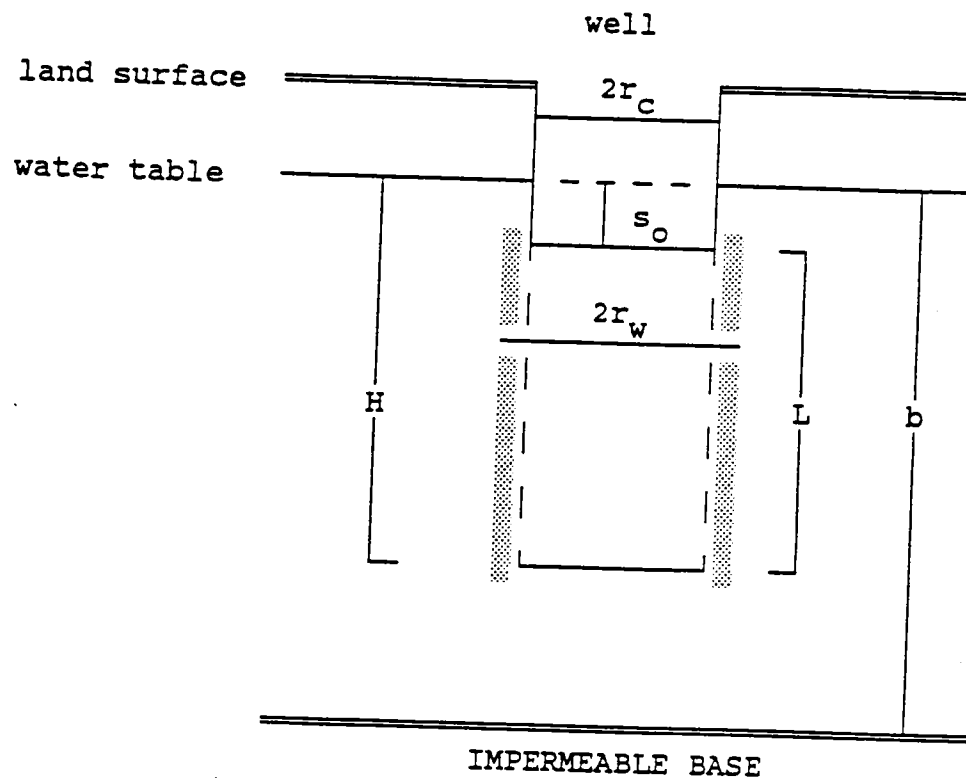
H = static height of water in well [L]

b = saturated thickness of aquifer

FIGURE 2.3.6 EQUATIONS AND ASSUMPTIONS

SLUG TEST METHOD FOR UNCONFINED AQUIFERS
(continued)

DEFINITION OF TERMS:



[illegible]

FIGURE 2.5.1

2.5.2 Ground Water

Ground-water samples were collected after purging a minimum of three well volumes from the monitoring well. Prior to sampling the monitoring well, the depth-to-water level from the top of the well casing was measured to the nearest 0.01 foot with an electronic water-level meter and recorded. Between each purge volume, a representative ground-water sample was collected for Ph, temperature, and specific conductance measurements to evaluate the efficiency of the purging process. A disposable, pre-cleaned, polyethylene bailer attached to a nylon rope by a stainless steel wire (leader) was lowered down the well to retrieve representative ground-water samples. Upon removal from the well, the water samples were transferred from the bailer into the designated sample containers in a manner that minimized agitation and aeration. Preservatives were added to the appropriate containers where required.

2.5.3 Sample Handling

Each sample container was individually identified by a specific Versar three-part label number. Pertinent information for each sample was filled out on the lower part of the label which was adhered to a page in the designated field notebook. The parameters to be analyzed for each sample were written on one of the upper parts of the label which was then adhered to the respective container. Afterward each container was placed in a cooler containing enough ice to maintain a temperature of 4°C. After sampling was completed, a chain of custody form was filled out (see Appendix B), placed in a plastic bag, and taped to the inside of the cooler lid. The cooler was then sealed under a custody seal and directly shipped to Versar Laboratories in Springfield, Virginia.

2.6 Laboratory Quality Control

Before samples were processed for laboratory analysis, chemical standards were analyzed to establish that the analytical instruments were functioning properly within the desired sensitivity. Calibration solutions were documented with the preparer's initials, date of preparation, concentrations of solutions, standard materials used to prepare the solutions, and expiration dates of the solutions. National Bureau of Standards (NBS) traceable standards were used in the preparation of the calibration solutions.

3.0 FINDINGS

3.1 Soil Borings

Pertinent information concerning the substrate beneath the subject site was recorded during the drilling of the soil borings as described in Section 2.1. This information was used to develop the Geologic Logs in Appendix A. Each soil sample collected from the borings was scanned with the Microtip and documented. Results of the Microtip PID scanning indicated that none of the six logged borings contained detectable concentrations of volatile organic compounds. The Microtip PID was used in the field only as a scanning device and was not relied upon to quantitatively determine specific levels of contamination.

The Windsor Formation was encountered in all the soil borings to a depth of 35 to 45 feet below the land surface. This formation was typified by yellowish to brown sand, silt, and clay. At a depth of 14 to 19 feet below the land surface, a consistent gray and tan stiff clay layer was encountered within each boring. Below the clay layer of the Windsor Formation is a yellowish silty sand with a significant percent of shell fragments, which represented the Yorktown Formation. This formation was encountered at 40 to 45 below the existing land surface. In each of the soil borings, ground water was encountered within the Yorktown Formation at a depth ranging between 41.0 to 50.0 feet below the land surface. The monitoring well was screened within the Yorktown Formation. Figure 3.1.1 shows the location of the test borings and the monitoring well.

3.2 Ground-Water Level Measurements

During test borings and the installation of the monitoring well the depth from existing grade to ground water was measured on November 12 through November 15, 1991. Ground water was encountered at depths ranging from 41.0 (BH-4) to 50.0 feet (MW-4) bls. At BH-1 the depth to ground water was not determined because the boring was only to 20 feet bls. The depth to ground water at the monitoring well was measured prior to purging the well for sampling on November 27, 1991 and was at 43.2 feet below the top of casing. The depth to ground water at the monitoring well was measured again during the slug test on December 19, 1991 and was at 43.4 feet below the top of casing. Corrected ground-water levels at the monitoring well based on a survey performed by Hoggard and Eure Associates are as follows:

November 27, 1991	37.2 feet above mean sea level.
December 19, 1991	37.0 feet above mean seal level.

PLOT DATE: 02-12-92

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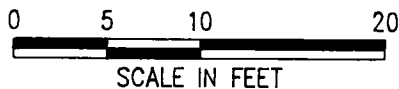
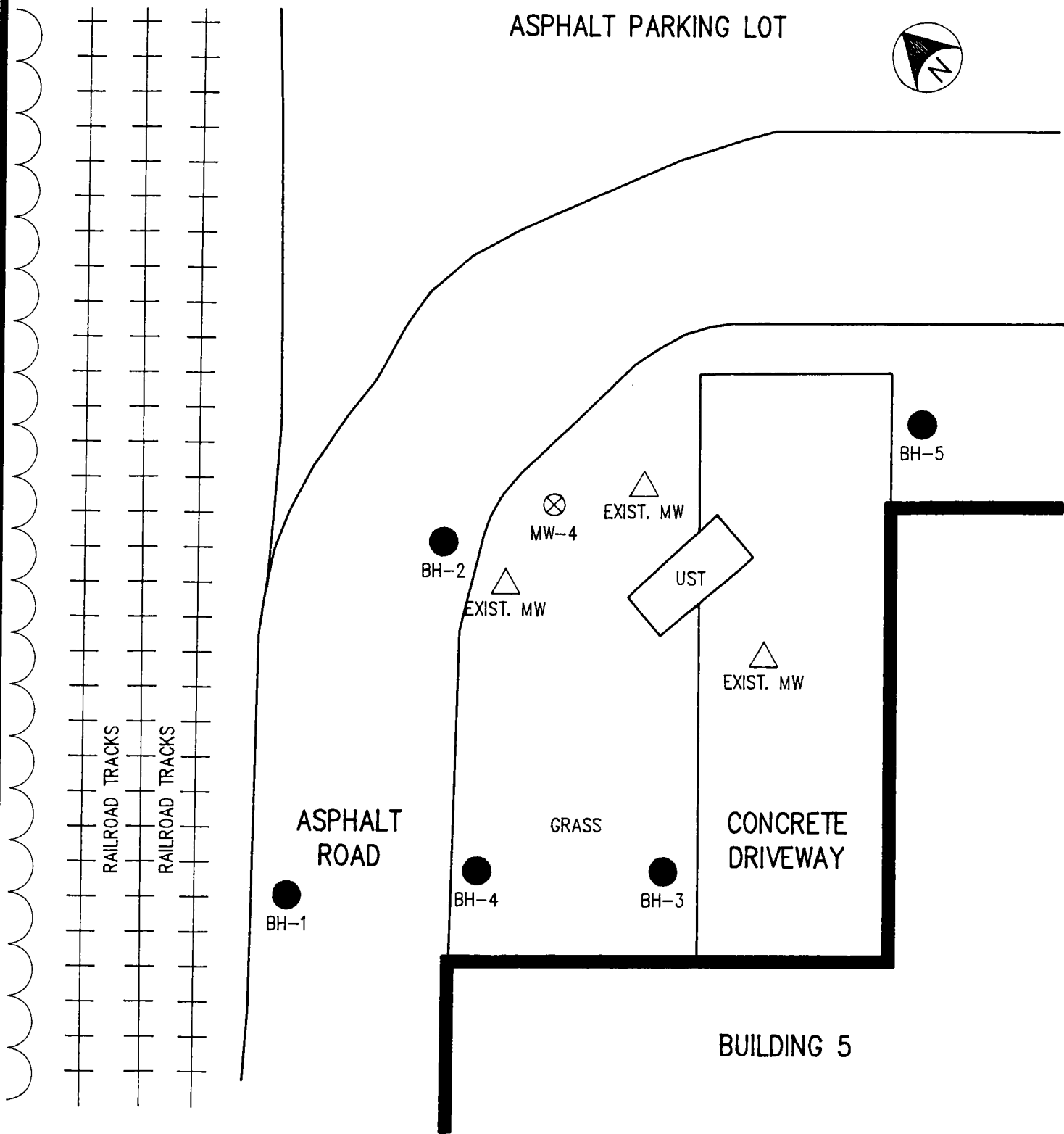


FIGURE 3.1.1

YORKTOWN NAVAL WEAPONS STATION

DESIGNED MAXWELL	DATE 10/31/91
DRAWN HEINIG	10/31/91
CHECKED	

YORKTOWN NAVAL WEAPONS STATION
PROPOSED MONITORING WELL LOCATION
PLAN AT BUILDING 5

Versar INC.
6850 VERSAR CENTER
SPRINGFIELD, VIRGINIA 22151
(703) 750-3000

APPROVAL	DATE 10/31/91
PROJECT NO. 5380.001.01	SCALE: AS SHOWN
DRAWING NO. 5380-F1	FIGURE 1 OF 1

The actual direction of ground-water flow was not able to be verified during this investigation because only one monitoring well was installed to intercept the shallow aquifer. However, ATEC determined in their previous investigation that ground-water flow was probably to the northwest due to the small creek to the northwest that feeds into Roosevelt Pond and the ravine to the northwest of the site. The USGS topographical map shows the highest elevation in the area to be at 80 feet above msl on the southeast side of the site, with the land terracing down to the small creek on the northwest side of the site. Building construction and other land improvements are not considered to have any major effect on the movement of ground water at this site.

3.3 Soil Analyses

During the drilling of the test borings, including the one for the monitoring well, soil samples for selected chemical analyses were collected within the top 10 feet of soil and from within 5 feet above the water table. Duplicate sampling was performed as a quality control measure. Tables 3.3.1 through 3.3.3 list the sample number, the locations, and depths within the borings and the results for each analysis performed. Photocopies of the analytical data are presented in Appendix B. The locations of the test borings and the monitoring well are shown in Figure 2.2.1.

A total of 18 soil samples were collected for TPH analyses using EPA Method 418.1. The results of these analyses are presented in Table 1. All 18 of the analyzed samples were below the method detection limit, which varied due to the amount of sample utilized during the analysis. As a result, the highest detection limit was 50 mg/kg or ppm, with most of the samples being reported at less than 25 ppm.

The 18 soil samples collected for BTEX content were analyzed using USEPA Method 8020. All 18 analyzed samples were found to be below the respective detection limit for the individual BTEX components except the sample from Test Boring 4. This particular sample had concentrations of benzene, toluene, and ethylbenzene, that were below the respective detection limits but did contain 2.9 ppb xylene. This concentration of xylene, however, is well below the RCRA 40 CFR 261.31 level of 150 ppb, and is also well below the Virginia State Water Control Board (VSWCB) guideline for total BTEX of 10 ppm for soil disposal.

Soil samples collected for EOX were analyzed using EPA Method 9020. Of the 18 analyzed samples, 17 were found to be below the detection limit with the remaining sample from Test Boring 1 having concentrations of 15 ppm. This sample was reported to have been of insufficient volume to obtain a lower detection limit. Because the VSWCB guidelines for

TABLE 3.3.1

Sample No./Location	TPH mg/kg	Benzene ug/kg	Toluene ug/kg	Ethylbenzene ug/kg	Xylenes ug/kg	EOX mg/kg
64380/64381 BH-1-5 6-8'	ND	ND	ND	ND	ND	ND
64383/64384 BH-1-5 15-18'	ND	ND	ND	ND	ND	
64385/64386 BH-1-5 15-18'	ND					15
64389/64390 BH-2-5 2.5-6.5'	ND	ND	ND	ND	ND	ND
64392/64393 BH-2-5 2.5-6.5'		ND	ND	ND	ND	
64395/64396 BH-2-5 23-25'		ND	ND	ND	ND	
64398/64399 MW-4-5 2-6'	ND	ND	ND	ND	ND	ND
64401/64402 MW-4-5 41-45'	ND	ND	ND	ND	ND	
64404/64405 MW-4-5 41-45'	ND	ND	ND	ND	ND	ND
64407/64408 BH-3-5 8-10'		ND	ND	ND	ND	
64410/64411 BH-3-5 38-42'	ND	ND	ND	ND	ND	

TABLE 3.3.1

Sample No./Location	TPH mg/kg	Benzene ug/kg	Toluene ug/kg	Ethylbenzene ug/kg	Xylenes ug/kg	EOX mg/kg
64413/64414 BH-3-5 38-42'		ND	ND	ND	ND	
64416/64417 BH-4-5 8-10'	ND	ND	ND	ND	ND	
64419/64420 BH-4-5 38-42'	ND	ND	ND	ND	2.9	ND
64422/64423 BH-4-5 38-42'	ND	ND	ND	ND	ND	
64425/64426 BH-5-5 14-16'	ND	ND	ND	ND	ND	ND
64428/64429 BH-5-5 34-38'	ND	ND	ND	ND	ND	ND
64431/64432 BH-5-5 34-38'	ND	ND	ND	ND	ND	ND

NOTES:

Sample locations are stated as BH and MW for Borehole and Monitoring Well. Example BH-1-5 represents Borehole number 1, at the Building 5 Site.

Elevations stated are from grade level to sample depth.

ND = Not detected above laboratory detection limit.

TABLE 3.3.2
TCLP Metals

Sample No./ Location	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
Criteria ppm	5.0	100	1.0	5.0	5.0	0.2	1.0	5.0
64382 BH-1-5 6-8'	.370	.114	.050	.060	.300	.010	.040	.040
64387 BH-1-5 15-18'	.370	.174	.050	.060	.300	.010	.040	.040
64388 BH-1-5 15-18'	.370	.225	.050	.060	.300	.010	.040	.040
64391 BH-2-5 2.5-6.5'	.370	.174	.050	.060	.300	.010	.040	.040
64394 BH-2-5 2.5-6.5'	.370	.122	.050	.060	.300	.010	.040	.040
64397 BH-2-5 23-25'	.370	.104	.050	.060	.300	.010	.040	.040
64400 BH-4-5 2-6'	.370	.052	.050	.060	.300	.010	.040	.040
64403 MW-4-5 41-45'	.370	.297	.050	.221	.300	.010	.040	.350
64406 MW-4-5 41-45'	.370	.272	.050	.190	.300	.010	.040	.325
64409 BH-3 8-10'	.370	.867	.050	.060	.300	.010	.040	.040
64412 BH-3-5 38-42'	.370	.357	.050	.379	.300	.010	.040	.799
64415 BH-3-5 38-42'	.370	.299	.050	.298	.300	.010	.040	.627
64418 BH-4-5 8-10'	.370	.052	.050	.060	.300	.010	.040	.040
64421 BH-4-5 38-42'	.370	.333	.050	.228	.300	.010	.040	.200

TABLE 3.3.2**TCLP Metals**

Sample No./ Location	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
64424 BH-4-5 38-42'	.370	.326	.050	.0631	.300	.010	.040	.200
64427 BH-5-5 14-16'	.370	.0955	.050	.060	.300	.010	.040	.040
64430 BH-5-5 34-38'	.370	.350	.050	.315	.300	.010	.040	.676
64433 BH-5-5 34-38'	.370	.384	.050	.367	.300	.010	.040	.852

NOTES:

Sample locations are stated as BH and MW for Borehole and Monitoring Well. Example BH-1-5 represents Borehole Number 1, at the Building 5 Site.

Elevations stated are from grade level to sample depth.

Criteria based on RCRC 40 CFR 261

TABLE 3.3.3							
PCB Results Expressed as ppb							
Sample Number Location	AROCLORS						
	1016	1221	1232	1242	1248	1254	1260
64381 BH-1-5 6-8'	23	23	23	23	23	47	47
64385 BH-1-5 15-18'	25	25	25	25	25	51	51
64386 BH-1-5 15-18'	25	25	25	25	25	51	51
64390 BH-2-5 2.5-6.5'	22	22	22	22	22	44	44
64393 BH-2-5 2.5-6.5'	22	22	22	22	22	44	44
64396 BH-2-5 23-25'	24	24	24	24	24	48	48
64399 MW-4-5 2-6'	22	22	22	22	22	45	45
64402 MW-4-5 41-45'	30	30	30	30	30	60	60
64405 MW-4-5 41-45'	30	30	30	30	30	61	61
64408 BH-3-5 8-10'	23	23	23	23	23	45	45
64411 BH-3-5 38-42'	25	25	25	25	25	50	50
64414 BH-3-5 38-42'	25	25	25	25	25	50	50

TABLE 3.3.3							
PCB Results Expressed as ppb							
Sample Number Location	AROCLORS						
	1016	1221	1232	1242	1248	1254	1260
64417 BH-4-5 8-10'	22	22	22	22	22	43	43
64420 BH-4-5 38-42'	27	27	27	27	27	54	54
64423 BH-4-5 38-42'	27	27	27	27	27	53	53
64426 BH-5-5 14-16'	22	22	22	22	22	44	44
64429 BH-5-5 34-38'	26	26	26	26	26	51	51
64432 BH-5-5 34-38'	26	26	26	26	26	51	51

NOTES:

Sample locations are stated as BH and MW for Borehole and Monitoring Well. Example BH-1-5 represents Borehole Number 1, at the Building 5 Site.

Elevations stated are from grade level to sample depth.

EOX for soil disposal is 100 ppm, an EOX level of 15 ppm, would not, therefore, be considered significant.

The soil samples collected for toxicity characteristic leachate procedure (TCLP) Metals were analyzed according to Method 1311, Appendix II. This method utilized ICP Method 3005 and GFAA Method 7704 for the extraction preparation, Method 6010 for the ICP Analysis, Method 747 for the mercury extraction preparation and analysis, and Method 7740 for the GFAA analysis for selenium. Based on a comparison of the data in Table 3.3.2 and the RCRA 40 CFR 261 criteria for the determination of hazardous wastes, all of the 18 analyzed samples were well below the individual EPA criteria for each specific tested metal.

A total of 18 soil samples were collected for polychlorinated biphenyl (PCB) analysis by USEPA Method 8080. This analysis was included in the scope of work due to the tank having been used as a waste oil tank. These samples were analyzed for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260. All of the PCB results were in the ppb range with the highest sample results being 61 ppb of Aroclors 1254, and 1260 in the sample from MW-4. These results are far below the EPA 40 CFR 761.125 criteria of 1.0 ppm for PCB spill clean up. This criterion requires an area containing 10 ppm or more of PCBs to be backfilled with clean soil, which is defined as containing less than 1 ppm of PCBs.

3.4 Ground-Water Analyses

The results of the ground-water analyses are listed in Table 3.4.1. Photocopies of the analytical data sheets are presented in Appendix B.

A water sample collected from the monitoring well was analyzed for Total Petroleum Hydrocarbons (TPH) per method MCAWW 418.1. This sample was found to contain 0.40 ppm TPH, which is well below the VSWCB criteria of 1.0 ppm. The water sample collected for BTEX was analyzed by EPA Method 602. The results of this analysis indicate that only xylene (2.2 ppb) was present above the respective detection limit. This concentration is far below the USEPA Drinking Water Standard of 10,000 ppb xylene.

3.5 Slug Test Results

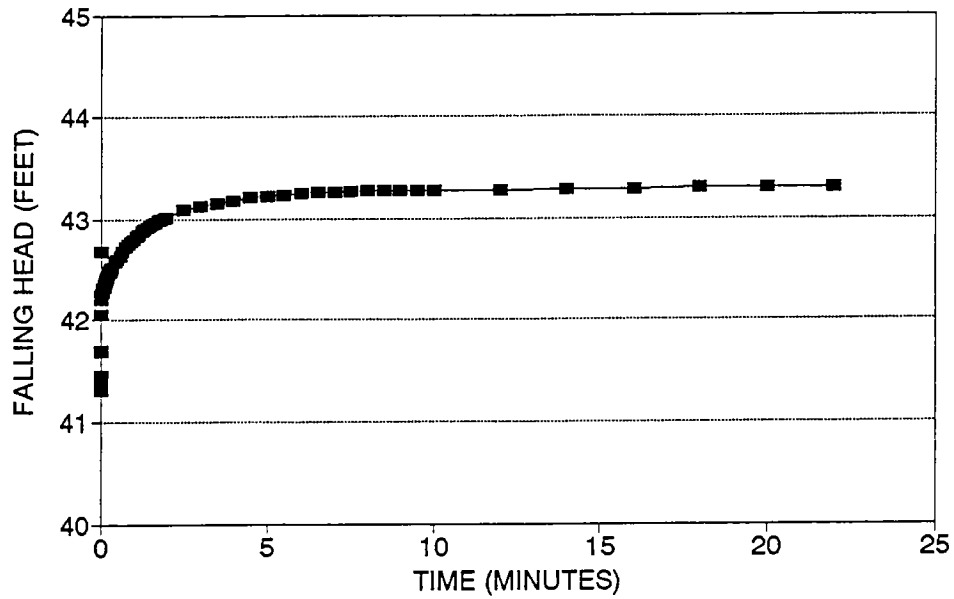
The results of the aquifer tests performed at the Yorktown Naval Weapons Station Building 5 site are presented graphically in Figures 3.5.1 and 3.5.2. The first set of graphs (Figure 3.5.1) depicts the amount of displacement (feet) in the well versus time (minutes), while the second set of graphs (Figure 3.5.2) depict the calculated hydraulic conductivity of

TABLE 3.4.1**Water Sample Results**

Sample No. Location	TPH (ppm)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylene PPB
64465 MW-4-5	0.40	-	-	-	-
64464 MW-4-5	-	<1.0	<1.0	<1.2	2.2

FIGURE 3.5.1 SLUG TEST DATA

YORKTOWN NWS
BLD 5 MW-4 SLUG TEST



YORKTOWN NWS
BLD 5 MW-4 SLUG TEST

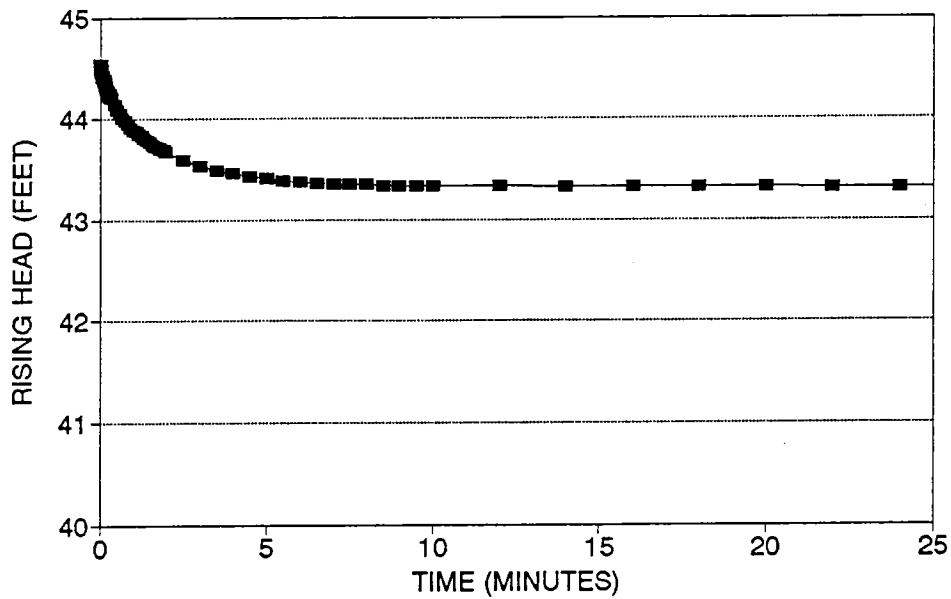
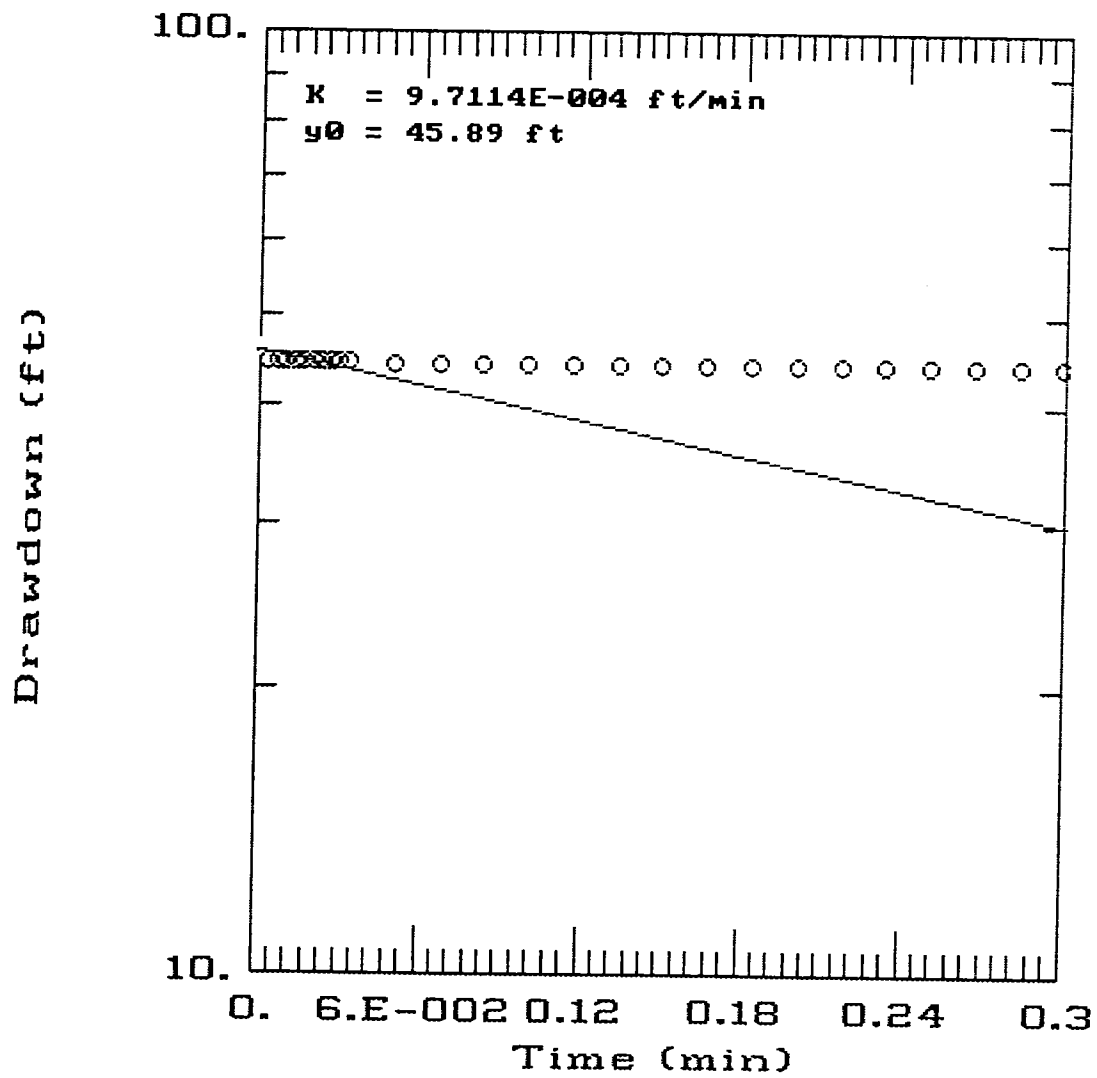


FIGURE 3.5.2 SLUG TEST RESULTS

BUILDING 5 MW-4 SLUG TEST RESULTS



the aquifer in the immediate vicinity of the tested well.

Based on the evaluation of the slug test data through use of the AQTESOLV program, the transmissivity for the area around MW-4 was estimated to be approximately $1.9\text{E-}02$ feet squared per minute (ft^2/min). The hydraulic conductivity was estimated to be approximately $9.7\text{E-}04$ ft/min. This is within the $10\text{E-}04$ ft/min range of values presented in Freeze and Cherry (1979) as typical for unconsolidated silty sand deposits. The equations and assumptions used in the evaluation of the data from the slug tests are presented in both Figures 2.3.5 and 2.3.6. The hydraulic conductivity (K) value was derived directly from the hydraulic estimation equation. The transmissivity value was derived by multiplying the hydraulic conductivity by the estimated saturated thickness of the aquifer.

4.0 PRELIMINARY EXPOSURE ASSESSMENT

Human and non-human receptors, which could have been, or could be exposed to petroleum contamination were evaluated. A completed exposure pathway is one in which there is a contaminant source, a reasonable migration pathway, and a realistic scenario under which a receptor may be exposed. No completed exposure pathways were identified in this evaluation, because no contamination was identified in the assessment.

Human receptors potentially exposed by the UST at Building 5 were the personnel working at the site, personnel working on the land down gradient from the site, and personnel using or coming in contact with the water in Roosevelt Pond.

Building 5 is a Fork Lift Training Facility. Personnel working in this area have limited contact with the soil and pavement north and west of the tank. If present, contamination in the soil and on the pavement could pose a dermal exposure hazard and the evaporation of petroleum contamination could subject personnel in this area to exposure through inhalation. The soil sample data in Tables 3.3.1 through 3.3.3 show no contamination in the samples collected in the top 10 feet of soil. No contamination on the surface was noted during the installation of the monitoring well or during the test borings. Based on the sample data personnel working at or around Building 5 are not subjected to contamination due to the UST.

Roosevelt Pond is not used as a water source by personnel on the Naval Weapons Station. The potential for personnel to contact this water is therefore limited. The water samples collected from the monitoring well located 10 feet down gradient from the UST show no contamination of the ground water. These results are shown in Table 3.4.1. Based on the water sample data at the tank site no contamination from the UST would be present at Roosevelt Pond. The only water supply well in the general area of the site is used for process water and is not a potable water source. Drinking water is supplied to the base by the city of Newport News, Virginia.

Non-human receptors in the area of the UST, on the land down gradient from the site, and at Roosevelt Pond include small mammals, nesting birds, and aquatic life at the pond. No contamination was found in any of the soil and water samples. Based on the sample results contamination from the UST would not pose an exposure hazard to the non-human receptors at the locations down gradient from the site.

5.0 PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES

The corrective action recommended for the UST at the Building 5 site is based on the sample results from the Versar site assessment. The sample data presented in the previous investigation by ATEC has been considered in developing the recommended corrective action plan, but the extent of the contamination to be remediated is based on the Versar assessment.

Based on the results of the site assessment only one remedial action is considered to be appropriate. Removal of the UST is planned by the Naval Weapons Station, and is the only action that will both remove the potential for future contamination release and allow the determination of the contamination present in the soil in contact with the tank.

The Versar recommendation for removal of the UST and associated soil would be performed with the use of conventional excavation equipment. A small mobile crane may be needed to lift the tank intact. The concrete casing installed above the tank will need to be removed with the use of an air powered impact hammer prior to the start of the excavation.

Excavation of the soil above and adjacent to the storage tank should be performed with all soil being field screened by an Environmental Professional. Soil determined to be or suspected of being contaminated with petroleum should be staged on polyethylene pending off site analysis. Field screening of soil should be performed with a direct reading instrument such as a PID. After the tank is removed, the soil beneath the tank location should be screened. Excavation should continue if soil in this area is found to be contaminated above the 100 ppm TPH Action Level as determined by the field screening. This soil should also be staged on polyethylene, and samples collected for laboratory analysis.

The UST should be removed by the attachment of cables and lifting straps to the tank. The tank has already been pumped out, however small amounts of residual product may remain in the tank. Dry ice should be introduced into the tank to evacuate vapors prior to beginning the lifting operation. The tank should be deformed in an appropriate manner to prevent the reuse of the tank as a storage vessel.

It is anticipated that the soil in contact with the tank will be contaminated. This contamination being the result of spills at the tank location since the tank installation in 1956, or from leaks in the tank indicated by the failing volumetric test in December of 1990.

The removal of hydrocarbons from soil can be accomplished by using one of the

following methods: 1) excavation and disposal; 2) enhanced vaporization on-site; 3) excavation and enhanced vaporization off-site; 4) excavation and incineration; 5) bioremediation; 6) soil washing, and 7) soil venting.

Due to the relatively small amount of soil expected to be treated or shipped for disposal, only one of these options, excavation and enhanced vaporization off site is considered to be economically appropriate. On site treatment of the material would involve specialized equipment being obtained, and staffing of a long-term remedial operation. The tank location would be restricted during the on-site treatment and, therefore, not usable by the Building 5 Personnel. Off-site disposal in a chemical waste landfill is costly and not a preferred method of handling petroleum contaminated soil. Off-site disposal by shipping the soil to a batch asphalt processing plant, was considered as an option. This option is not restrictive due to costs but the petroleum contamination is not removed. Excavation and enhanced vaporization at an off-site facility is the method of treatment recommended for this site.

Soil can be excavated and tested for BTEX and TPH. Soil would be staged on site pending the analytical results. Soil found to be contaminated can then be shipped to a facility licensed by the State to perform soil treatment. The soil is fed into an oven by conveyor belt, heated to release the VOC's, and the cleaned soil remains with the treatment facility. Cleaned soil is usually applied to landfills as cover. The VOC's that have been released from the soil are burned in an after burner. Facilities of this nature are available in the State of Virginia.

After removal of the tank from the excavation, the tank will be inspected. Any remaining product that was not collected prior to removal will be collected at that time. The tank will then be transported off-site to be cleaned. After the petroleum products have been removed from all surfaces of the tank the steel can be transported to a scrap metal facility.

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The portion of the Yorktown Formation in which the monitoring well was screened is composed mostly of yellowish silty sand with a significant percentage of shell fragments. In each of the borings ground water was encountered at depths ranging between 41 to 50 feet below the land surface. Based on observations made in the field and review of the ATEC 1991 investigation, Versar, Inc., has estimated that ground-water flow is to the northwest.

The analytical results for TPH, BTEX, and EOX indicate that petroleum-related contamination within the soil in the immediate area of the subject tank is relatively low and not widespread and that the local ground water has not yet been impacted. This lack of distribution of contaminants suggest that, although the tank failed a tightness test, the contamination identified in the previous ATEC investigation is localized and may not have migrated to any great extent. The detected levels for total BTEX, EOX, and PCBs were all below the applicable respective VSWCB or USEPA guidelines/criterion. In addition, the results of the TCLP analyses showed that the soil extractions were below the respective individual metal action level. Based on the Versar analytical results, the ATEC sample results are not considered to be characteristic of this site.

The results of the aquifer tests indicated that the local transmissivity value for the tested well area was $1.9\text{E-}02 \text{ ft}^2/\text{min}$. The hydraulic conductivity (K) value was $9.7\text{E-}04 \text{ ft/min}$ or 1.4 ft/day , which is in the same order of magnitude of $10\text{E-}04 \text{ ft/min}$. According to Freeze and Cherry (1979), a value in hydraulic conductivity of $10\text{E-}04 \text{ ft/min}$ would be considered typical for unconsolidated silty sand deposits. Hydraulic conductivity (K) values were derived directly from hydraulic property estimation equations. Transmissivity values were derived by multiplying the hydraulic conductivity value by the estimated saturated thickness of the aquifer.

6.2 Recommendations

Based on the field observations and the results of the laboratory analyses, the following recommendations are made for the study site:

- Versar, Inc. concurs with the scheduled tank closure by excavation and removal. The tank should be drained, purged, cleaned, and removed by a licensed contractor in accordance with the American Petroleum Institute's Bulletin (1987) 1604 (1987). During removal, a qualified environmental scientist should be

present to monitor the tank removal activities to ensure they are performed in a regulatory acceptable fashion. As much petroleum-impacted soil as possible should be removed, transported, and disposed of in accordance with all applicable local, state, and federal regulations.

- After the subject UST is cleaned and removed, a visual inspection of the excavation should be made. Representative soil samples should be collected along the walls and at the bottom of the excavation by the on-site environmental scientist prior to backfilling with granular, clean material. The soil and ground-water (if present) samples should be submitted to an accredited laboratory for BTEX and TPH analysis.

7.0 REFERENCES

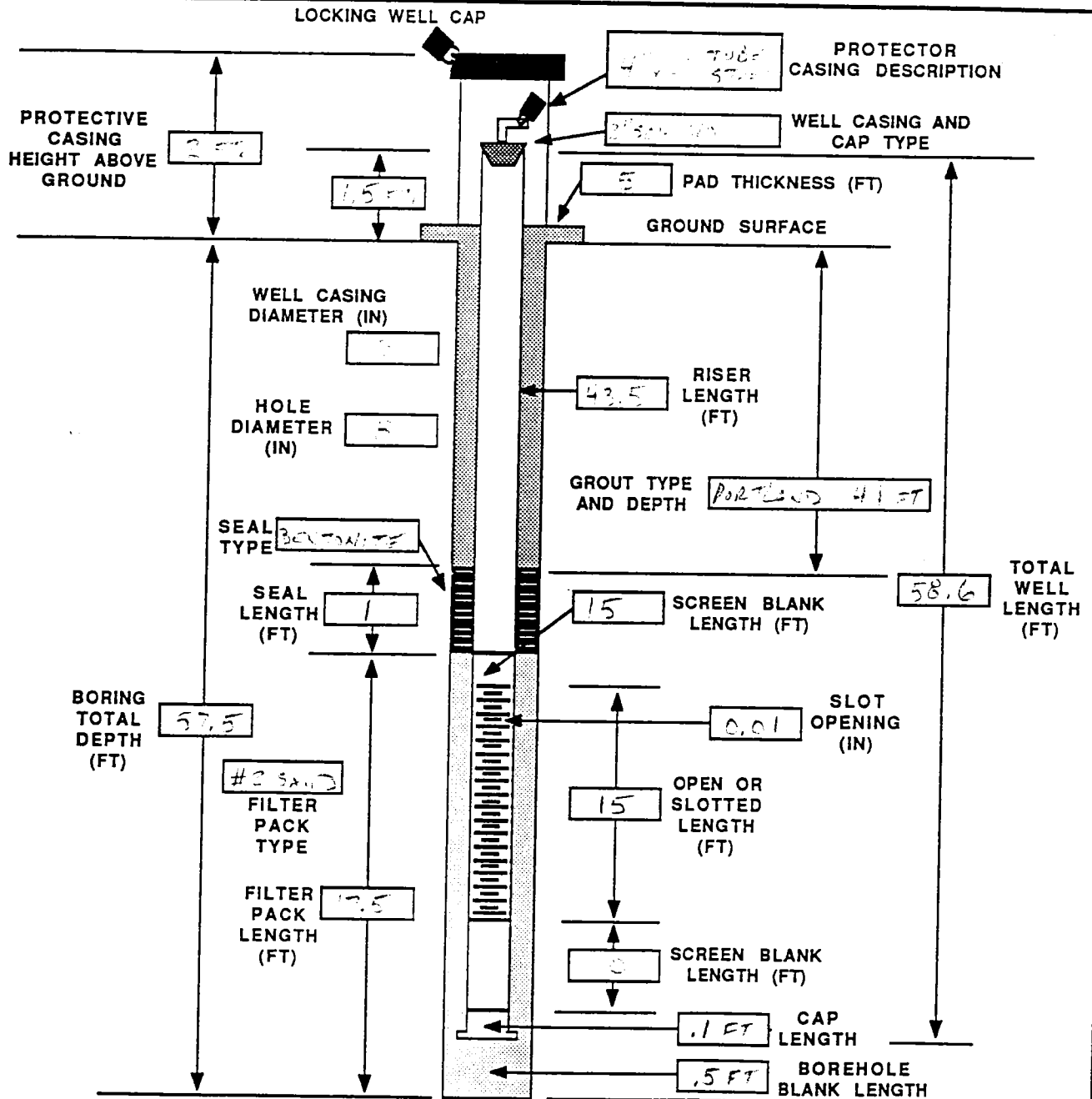
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APPENDIX A

**WELL CONSTRUCTION DIAGRAM,
SOIL BORING LOGS AND FIELD DATA SHEETS**

WELL CONSTRUCTION DIAGRAM

PROJECT: YORKTOWN 100-101 JOB NUMBER: 5380.001.01
LOCATION: RED 1
WELL NUMBER: 100-101 ELEVATION: _____
DATE INSTALLED: 10/12/78
☐ GROUND ☐ CASING ☐ PROTECTOR CASING
☐ ABOVE GROUND LEVEL ☐ ABOVE MEAN SEA LEVEL



COMMENTS: _____

PROJECT: YORKTOWN NAVAL WEAPON STATION JOB NUMBER: 5380.1
LOCATION: BLDG 5 SITE, BORE HOLE 1 DATE LOGGED: 11/12/91
BORING/WELL NO. & LOCATION: BH-1 WEST SIDE OF ROADWAY BETWEEN
RAILROAD TRACKS AND LOADING DOCK

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION
2	↓	15/6	24/5	0.0		ASPHALT PROBABLE FILL, ORANGE SAND W/ROCK FRAGMENTS
6	↓	2.2 3.4	24/8	0.0		ORANGE TO BROWN FINE SAND W/SOME CLAY NO ODOR
8	↓	7.11 8.7	24/18	0.0		BROWN TO ORANGE FINE SAND W/LITTLE CLAY NO ODOR
10	↓	4.6 10.10	24/18	0.0		ORANGE FINE SAND W/LITTLE CLAY NO ODOR
16	↓	6.6 9.8	24/20	0.0		ORANGE + GREY MOTTLED CLAY TIGHT NO ODOR
20	↓	5.5 7.8	24/22	0.0		ORANGE MEDIUM SAND W/TRACE CLAY IN CLUMPS NO ODOR

LOGGED BY:

Bradley J. White

PAGE 1 OF 1

PROJECT: YORKTOWN NAVAL WEAPONS STATION JOB NUMBER: 5380.1
 LOCATION: BDC-5, BORE HOLE 2 DATE LOGGED: 11/12/91
 BORING/WELL NO. & LOCATION: BH-2, EDGE OF PAVEMENT, 23' FROM
CENTER OF TANK, ADJACENT TO EXISTING MW-3

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION
2'	↓ 6.14 7.8	24/12	0.0			ASPHALT BROWN FINE SAND W/SOME CLAY NO ODOR
4'	↓	24/	0.0			LIGHT BROWN FINE SAND AND CLAY NO ODOR
6'	↓ 13.16 14.8	24/15	0.0			LIGHT BROWN CLAY W/LITTLE FINE SAND NO ODOR
10'	↓ 5.10 13.16	24/20	0.0			TAN-BROWN MOTTLED CLAY W/LITTLE FINE NO ODOR SAND
15'	↓ 6.7 7.7	24/18	0.0			13'-14' BROWN AND GRAY CLAY W/SOME FINE SAND RED-GRAY MOTTLED CLAY NO ODOR 14'-15'
20'	↓ 7.5 5.5	24/24	0.0			18-18.5' RED CLAY FINE AND MEDIUM YELLOW SAND NO ODOR 18.5'-20'
25'	↓ 4.4 8.4	24/22	0.0			ORANGE AND YELLOW FINE SAND NO ODOR W/TRACE CLAY
40'	↓ 9.12 10.11	24/24	0.0			TAN CLAY W/SOME FINE SAND NO ODOR
45'	↓ 9.14 17.17	24/24	0.0			43' TO 44.5' ORANGE CLAYEY FINE SAND YORKTOWN FORMATION - COARSE SAND AND NO ODOR SHELLS 44.5-45'
				▽		49' BOTTOM OF BORING

LOGGED BY:

Bruce J. [Signature]

PAGE

1

OF

1

PROJECT: YORKTOWN NAVAL WEAPONS STATION JOB NUMBER: 5380.1
LOCATION: BLDG. 5, BORE HOLE 3 DATE LOGGED: 11/14/91
BORING/WELL NO. & LOCATION: BH-3 ON GRASS ADJACENT TO CONCRETE
DRIVEWAY NEAR MAIN SECTION OF BLDG 5

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION	NO ODOR
2	↓	2.2 2.3	24/6	0.0		BROWN TOP SOIL SANDY W/ ORGANIC MATERIALS	NO ODOR
4	↓	5.7 7.3	24/12	0.0		ORANGE VERY FINE SAND W/ SOME CLAY	NO ODOR
						8-8.5' ORANGE AND BROWN CLAY W/ LITTLE FINE SAND	NO ODOR
10	↓	8.7 7.6	24/22	0.0		8.5-10' FINE ORANGE SAND	
15	↓	4.8 11.12	24/24	0.0		ORANGE AND GREY MOTTLED CLAY	NO ODOR
20	↓	6.3 3.6	24/24	0.0		18-18.5' ORANGE MEDIUM SAND 18.5-19' ORANGE CLAY 19-20' FINE AND VERY FINE SAND	NO ODOR
25	↓	4.4 4.5	24/24	0.0		23-23.5' TAN CLAY 23.5-25' GREY CLAY	NO ODOR
30	↓	5.5 6.5	24/24	0.0		GREY CLAY	NO ODOR
35	↓	9.10 9.9	24/24	0.0		33-33.5' GREY CLAY 33.5-35' YORKTOWN FORMATION GOLDEN, MEDIUM TO COARSE W/ SHELLS	NO ODOR
40	↓	14.9 9.12	24/24	0.0		YORKTOWN FORMATION, SILTY	NO ODOR
42	↓	13.7 7.6	24/24	0.0		YORKTOWN FORMATION, SILTY	NO ODOR
47	↓	13.13 15.16	24/24	0.0	▽	YORKTOWN FORMATION, SILTY	NO ODOR

LOGGED BY:

Bradley J. Vento

PAGE 7 OF 7

PROJECT: YORKTOWN NAVAL WEAPONS STATION JOB NUMBER: 5380.1
 LOCATION: BLDG 5, BORE HOLE 4 DATE LOGGED: 11/15/91
 BORING/WELL NO. & LOCATION: BH-4, ON GRASS BETWEEN
BH-1 AND BH-3 NORTH OF LOADING DOCK

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION
2	↓ 3.5 5.4	24/12	0.0			0-1' TOP SOIL 1-2' ORANGE SANDY CLAY NO ODOR
4	↓ 2.4 3.2	24/10	0.0			TAN CLAY W/ LITTLE VERY FINE SAND NO ODOR
10	↓ 7.8 7.8	24/20	0.0			ORANGE MEDIUM SAND W/ TRACE CLAY NO ODOR
15	↓ 6.8 11.12	24/22	0.0			ORANGE, PINK + GREY MOTTLED CLAY NO ODOR
20	↓ 7.9 9.12	12/19	0.0			18-19' RED CLAY W/ LITTLE FINE SAND NO ODOR 19-20' TAN MEDIUM SAND
25	↓ 3.3 4.4	24/22	0.0			23-24.5' ORANGE CLAY W/ TRACE FINE SAND 24.5-25' GREY CLAY NO ODOR
30	↓ 5.6 5.4	24/24	0.0			GREY CLAY W/ LITTLE VERY FINE SAND NO ODOR
35	↓ 12.9 10.10	24/24	0.0			ORANGE CLAY W/ SOME FINE SAND FRIABLE RUST ORANGE PIECES IN BOTTOM OF SAMPLE NO ODOR
40	↓ 3.1 5.7	24/24	0.0			YORKTOWN FORMATION, GOLDEN, COARSE W/ SHELLS NO ODOR
42	↓ 5.8 9.12	24/24	0.0			YORKTOWN FORMATION, MEDIUM BROWN SILTY W/ SHELLS NO ODOR

PROJECT: YORKTOWN NAVAL WEAPONS STATION JOB NUMBER: 5380.1
 LOCATION: BLDG 5, BORE HOLE 5 DATE LOGGED: 11-15-91
 BORING/WELL NO. & LOCATION: BH-5, AT EAST EDGE OF CONCRETE DRIVEWAY ON GRASS NORTH OF BLDG. 5

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION
2	↓	7.5 4.1	24/2	0.0		GRAVEL AND CHIPS OVER ORANGE CLAY W/SOME FINE SAND NO ODOR
4	↓	7.8 13.10	24/12	0.0		ORANGE CLAY W/SOME FINE SAND NO ODOR
10	↓	5.8 7.8	24/6	0.0		ORANGE CLAY W/SOME FINE SAND NO ODOR
12	↓	3.3 6.7	24/2	0.0		ORANGE CLAY W/LITTLE FINE SAND NO ODOR
16	↓	7.4 5.5	24/16	0.0		14-14.3' BROWN CLAY W/SOME FINE SAND 14.3-16' MEDIUM ORANGE SAND NO ODOR
21	↓	8.8 5.6	24/20	0.0		19-20' TAN MEDIUM SAND NO ODOR 20-21' ORANGE FINE SAND W/LITTLE CLAY
26	↓	8.7 8.7	24/22	0.0		GREY CLAY W/SOME SILT NO ODOR
31	↓	7.7 9.10	24/24	0.0		GREY CLAY W/SOME SILT NO ODOR
36	↓	9.10 10.7	24/24	0.0		34-35' TAN CLAY W/SOME SHELLS NO ODOR 35-36' YORKTOWN FORMATION
38	↓	12.13 9.8	24/24	0.0		WHITE SHELLS W/SOME FINE SAND NO ODOR
43	↓	13.11 13.16	24/24	0.0	▽	YORKTOWN FORMATION, COARSE W/SHELLS NO ODOR

PROJECT: YORKTOWN NAVAL WEAPONS STATION JOB NUMBER: 5380.1
 LOCATION: BLDG. 5 MONITORING WELL 4 DATE LOGGED: 11-13-91
 BORING/WELL NO. & LOCATION: MW-4 ON GRASS BY EDGE OF ROADWAY,
BETWEEN EXISTING WELLS MW-2 AND MW-3 10.5' FROM CENTER OF TANK

DEPTH (FT)	SAMPLE INTERVAL	BLOW COUNTS PER 6 INCHES	ADVANCED/ RECOVERED (IN)	ORGANIC VAPORS (ppm)	WATER TABLE	SAMPLE DESCRIPTION
2	↓	4.4 7.4	24/6	0.0		MEDIUM DARK BROWN TOP SOIL SANDY W/ ORGANIC MATERIALS NO ODOR
4	↓	5.3 3.3	24/22	0.0		MEDIUM BROWN SAND W/ LITTLE CLAY NO ODOR
6	↓	6.9 12.3	24/20	0.0		LT. BROWN FINE SAND W/ LITTLE CLAY NO ODOR
11	↓	5.10 11.13	24/12	0.0		TAN, BROWN AND ORANGE MOTTLED CLAY W/ SOME FINE SAND NO ODOR
16	↓	5.5 10.11	24/22	0.0		ORANGE AND GREY MOTTLED CLAY NO ODOR
21	↓	5.5 6.6	24/20	0.0		TAN AND ORANGE MEDIUM SAND NO ODOR
26	↓	5.5 5.5	24/22	0.0		ORANGE FINE SAND W/ TRACE CLAY NO ODOR
31	↓	4.4 4.3	24/24	0.0		TAN AND ORANGE CLAY NO ODOR
36	↓	4.4 4.4	24/22	0.0		TAN CLAY AND SILT NO ODOR
41	↓	3.3 3.2	24/24	0.0		BROWN AND TAN CLAY AND SILT W/ TRACE SHELLS NO ODOR
43	↓	8.7 7.8	24/24	0.0		YORKTOWN FORMATION COARSE W/ SILT NO ODOR
						42-49' SOIL MOIST BUT NOT SATURATED
					▽	50' YORKTOWN FORMATION SATURATED

INCREMENTAL FIELD MEASUREMENTS

Site Yorktown Naval Facility
 Date 11-27-91
 Volume Removed 1) 0 2) 4 3) 8 4)
 Time 1) 9:09 2) 9:21 3) 9:41 4)
 Well No. MW-4 BLDG 5
 Performed by L. Matthews

<u>Specific Conductance</u>	<u>Trial No. 1</u>	<u>Trial No. 2</u>	<u>Trial No. 3</u>	<u>Trial No. 4</u>
Temperature °C <u>16.4</u>	<u>16.4</u>	<u>16.6</u>	<u>15.4</u>	<u></u>
Uncorrected (μmhos/cm)	<u></u>	<u></u>	<u></u>	<u></u>
Correction Factor	<u></u>	<u></u>	<u></u>	<u></u>
Specific Conductance	<u>500</u>	<u>530</u>	<u>520</u>	<u></u>
Corrected (μmhos/cm)	<u></u>	<u></u>	<u></u>	<u></u>

pH

Initial sample pH reading:

1) pH calibration on _____ standard: 4 = _____ 7 = _____ 10 = _____
 2) _____ standard: 4 = _____ 7 = _____ 10 = _____
 3) _____ standard: 4 = _____ 7 = _____ 10 = _____
 4) _____ standard: 4 = _____ 7 = _____ 10 = _____

	<u>Trial No. 1</u>	<u>Trial No. 2</u>	<u>Trial No. 3</u>	<u>Trial No. 4</u>
In-Situ Temperature	<u>—</u>	<u>—</u>	<u>—</u>	<u></u>
Sample pH	<u>6.7.0</u>	<u>6.89</u> <u>6.9</u>	<u>7.0</u>	<u></u>

1) pH recheck 4 = _____ 7 = _____ 10 = _____
 2) 4 = _____ 7 = _____ 10 = _____
 3) 4 = _____ 7 = _____ 10 = _____
 4) 4 = _____ 7 = _____ 10 = _____

VERSAR WELL DATA SHEET

Date: Beg. 11/27/91 End _____
 Site Name/Case No. 5830.1
 Well No./Location WV-4 (BLDG 5)
 SMO No./Fac. No. Yorktown Naval Facility

1. Well Information
 Inner Casing Diameter 2"
 Outer Casing Diameter 2 1/4"
 Outer Casing Height _____
 ΔOuter Casing Inner Casing _____
 Inner Casing Height _____
 Total Depth (to TIC) 58.0
 DTW (to TIC) 43.3
 Water Column Length 15'
 Casing Volume _____
 x 3 7.3 gal.
 DTW Time 9:00
 Date 11/27/91
 Personnel L. Matthews,
 B. Norton

2. General Observations
 Organic Vapors (HNu, OVA, TIP) _____

 Radiation _____
 Sediment Very silty
 Color _____
 Odor _____

3. Purge Methods
 Date 11-27-91
 Time: Begin 9:09 End 9:41
 Personnel B. Norton

 Volume Removed 8.09 gals

 Equipment dispensable
 bailer

4. Sample Methods
 Date 11-27-91
 Time: Begin 9:42 End _____
 Personnel L. Matthews

 Equipment disp. bailer

 Lot # _____
 Splits _____

5. Notes
 • Facility Well Security _____
 well lock
 • Disposal of Purge Water _____
 circum
 • Dedicated Equipment _____
 bailer + rope
 • Casing Material _____
 PVC
 • Nonaqueous Phases _____

 • Sampling Ambient Conditions _____

 • Other _____

APPENDIX B

**LABORATORY ANALYTICAL REPORT AND
CHAIN-OF-CUSTODY FORMS**

ANALYTICAL DATA PACKAGE
Metals Section

CLIENT: VERSAR DIV 61
SITE: YORKTOWN
CODE-BATCH: VERSYORK - 1
CONTROL #: 5819
VERSAR #: 5380.001.01
DATE: 18-DEC-91

Versar Laboratories INC.

TRACE METALS SECTION ANALYSIS NARRATIVE

Versar Code: VERSYORK - 1
Client: Versar Div 61
Control Number: 5819

Date: December 18, 1991
Site: Yorktown

This report contains the TCLP metals analytical results for eighteen soil sample received at Versar Laboratories, Inc. on November 18, 1991. The samples were analyzed for the toxicity characteristic constituents. The toxicity characteristic constituents and their regulatory level (ug/L) are listed below:

Arsenic	5000	Barium	100,000	Cadmium	1000	Chromium	5000
Lead	5000	Mercury	200	Selenium	1000	Silver	5000

Analytical Methods

The samples were extracted by the Federal Register, Toxicity Characteristic Leaching Procedure (TCLP) Volume 55, No. 126, June 1990, method 1311, appendix II. The leachates were then prepared and analyzed by the US EPA Test Methods for Evaluating Solid Waste, SW 846, third edition. The following is a summary of the methods:

Extract Preparation

Method:

ICP - 3005

GFAA - 7740

ICP Analysis

Method:

6010

Mercury - Extract
Preparation/Analysis

Method:

7470

GFAA Analysis
Selenium

Method:

7740

Analytical Results

The report is divided into the following sections. A description of each part and any comments concerning them is provided below:

Cover Page - Cross reference list of the laboratory sample numbers and the field sample numbers.

Form I - Summary of results for each sample.

Analytical Results (continued)

- Form IIA - Initial and continuing calibration verification results. All ICP recoveries were within the 10 % control limits. All graphite furnace atomic absorption (GFAA) and all cold vapor atomic absorption (CVAA) recoveries were within the 20 % control limits.
- Form III - Initial and continuing calibration blanks and preparation blank results. All blanks were less than the instrumental detection limit (IDL) except for:
- Extraction Blank #1 - As, Ba
- Extraction Blank #2 - As, Ba
- Form IV - ICP interference check sample. All recoveries were within 20 % control limits.
- Form VA - Spike sample recovery results. All spike recoveries were within 25 % control limits except for silver.
- Form IX - ICP serial dilution results. All serial dilutions agreed with the original sample results within 10 % control limits except for barium.
- Raw Data - Copies of all raw data associated with this report.

General Discussion

The barium concentrations detected above the IDL in the extraction blanks may be considered typical of the extraction procedure. The concentrations of arsenic observed in the two extraction blanks is believed to be due to a matrix interference. The samples were diluted by a factor of 10 prior to digestion and this matrix interference did not affect these results. All analyses were performed within the required holding times for metals.

The sample concentrations reported on the Form I's were bias corrected based upon spike recoveries (Form VA) according to section 8.2.5 in the TCLP method. The poor silver spike recovery was most likely the result of the precipitation of silver chloride during the hydrochloric acid digestion.

If there are any questions concerning this report, please contact Sheila Maguire at (703) 750-3000.

Prepared by: Lisa S. Lea

Reviewed by: W. M. Wain

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Client : VERSAR_DIV_61_____ Site: YORKTOWN_____

Lab Name: VERSAR Control No.: 5819_ Code: VERSYORK Batch:1_____

SOW No.: SW_846_3RD_ED_____

Sample No.	Lab Sample ID
64382	66739
64382S	66739S
64387	66740
64388	66741
64391	66742
64394	66743
64397	66744
64400	66745
64403	66746
64406	66747
64409	66748
64412	66749
64415	66750
64418	66751
64421	66752
64424	66753
64427	66758
64430	66754
64433	66755

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before
application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: W.T. Nivens Name: W.T. Nivens

Date: 12-18-91 Title: DIRECTOR

COVER PAGE - IN

00003

64382

% Solids: 0.0 Date Received: 11/18/91

Concentration Units: UG/L

[illegible]

Comments:

64387

Concentration Units: UG/L_____

[illegible]

Comments:

FORM I - IN

00005

64388

Date Received: 11/18/91

[illegible]

FORM I - IN

00006

64391

Date Received: 11/18/91

[illegible]

64394

Lab Sample ID: 66743

Date Received: 11/18/91

Concentration Units: UG/L_____

Comments:

64397

Date Received: 11/18/91

[illegible]

FORM I - IN

00009

64400

Concentration Units: UG/L__

00010

64403

Date Received: 11/18/91

[illegible]

64406

Date Received: 11/18/91

[illegible]

FORM I - IN

00012

64409

Date Received: 11/18/91

[illegible]

FORM I - IN

00013

64412

% Solids: 0.0 Date Received: 11/18/91

64415

Date Received: 11/18/91

[illegible]

64418

Date Received: 11/18/91

[illegible]

FORM I - IN

00016

64421

Date Received: 11/18/91

[illegible]

FORM I - IN

00017

64424

Date Received: 11/18/91

[illegible]

FORM I - IN

00018

64427

Lab Sample ID: 66758

Date Received: 11/18/91

[illegible]

64430

Lab Sample ID: 66754

Date Received: 11/18/91

[illegible]

FORM I - IN

00020

64433

Date Received: 11/18/91

00021

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE				
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG 5															Y (N)				
SAMPLERS: (Signature) <i>Bradley J. Norton</i>					(Printed) BRADLEY J. NORTON					NO. OF CONTAINERS BTEX (8020) TPH (418.1) TOTAL HALOGENS PCB (8090) TELP METALS										REMARKS	
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION																
64380	11/12	1400			BORE HOLE - 1 6'-8'		1	✓													
64381		1400					1		✓	✓	✓										
64382		1400					1						✓								
64383		1430					1	✓													
64384		1430					1	✓									DUP 64383				
64385		1430					1		✓	✓	✓										
64386		1430					1		✓	✓	✓						DUP OF 64385				
64387		1430					1						✓								
64388		1430					1						✓								
64389		1510			BORE HOLE - 2 2'-6"		1	✓													
64390		1510					1		✓	✓	✓										
64391		1510					1						✓								
Relinquished by: (Signature) <i>Bradley J. Norton</i>		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)											
(Printed) BRADLEY J. NORTON				(Printed)		(Printed)				(Printed)											
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 OF 54													
(Printed)				(Printed)																	

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG. 5															Y N		
SAMPLERS: (Signature)					(Printed)					REMARKS									
BULLY J. NORTON					BRADLEY J. NORTON														
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	BTEX (8020)	TPH (418.1)	TOTAL HALOGENS	PCB (8080)	TECP METALS								
64392	11/12	1510			BORE HOLE - 2 2'6"-6'6"	1	✓												
64393	↓	1510			2'6"-6'6"	1		✓	✓	✓									
64394	↓	1510			2'6"-6'6"	1					✓								
64395	↓	1630			23-25'	1	✓												
64396	↓	1630			23-25'	1		✓	✓	✓									
64397	↓	1630			23-25'	1					✓								
64398	11/13	1220			MW - 4 2'-6'	1	✓												
64399	↓	1220			2'-6'	1		✓	✓	✓									
64400	↓	1220			2'-6'	1					✓								
64401	↓	1430			41-45'	1	✓												
64402	↓	1430			41-45'	1		✓	✓	✓									
64403	↓	1430			41-45'	1					✓								

Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
BULLY J. NORTON											
(Printed)				(Printed)		(Printed)				(Printed)	
BRADLEY J. NORTON											

Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 of 54
(Printed)				(Printed)				

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME		PARAMETERS										INDUSTRIAL HYGIENE SAMPLE					
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG 5												Y N					
SAMPLERS: (Signature)				(Printed)				NO. OF CONTAINERS										REMARKS	
BRADLEY J. NORTON				BRADLEY J. NORTON				BTX (8020) TPH (418.1) TOTAL HALOGENS PCB (8080) TECP METALS											
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION														
64404	11/13	1430			MW-4	41-45'	1	✓											
64405	↓	1430			↓	41-45'	1		✓	✓	✓								
64406	↓	1430			↓	41-45'	1					✓							
64407	11/14	1440			BH-3	8-10'	1	✓											
64408	↓	1440			↓	8-10'	1		✓	✓	✓								
64409	↓	1440			↓	8-10'	1					✓							
64410	↓	1610			↓	38-42'	1	✓											
64411	↓	1610			↓	38-42'	1		✓	✓	✓								
64412	↓	1610			↓	38-42'	1					✓							
64413	↓	1610			↓	38-42'	1	✓											
64414	↓	1610			↓	38-42'	1		✓	✓	✓								
64415	↓	1610			↓	38-42'	1					✓							

Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
BRADLEY J. NORTON											
(Printed)				(Printed)		(Printed)				(Printed)	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 of 54			
(Printed)				(Printed)							

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME		PARAMETERS										INDUSTRIAL HYGIENE SAMPLE	
SAMPLERS: (Signature)		(Printed)										REMARKS			
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	BTEX (8020)	TPH (418.1)	TOTAL HAPs	PCB (8080)	TCMP METHS				
64416	11/15	1045			BH-4 8-10'	1	✓								
64417		1045			BH-4 8-10'	1		✓	✓	✓					
64418		1045			BH-4 8-10'	1				✓					
64419		1245			BH-4 38-42'	1	✓								
64420		1245			BH-4 38-42'	1		✓	✓	✓					
64421		1245			BH-4 38-42'	1				✓					
64422		1245			BH-4 38-42'	1	✓								
64423		1245			BH-4 38-42'	1		✓	✓	✓					
64424		1245			BH-4 38-42'	1				✓					
64425		1530			BH-5 14-16'	1	✓						HOLD		
64426		1530			BH-5 14-16'	1		✓	✓	✓			HOLD		
64427	✓	1530			BH-5 14-16'	1				✓			HOLD		
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)					
(Printed)				(Printed)		(Printed)				(Printed)					
BRADLEY J. NORTON															
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks							
(Printed)				(Printed)				12 OF 54							

CHAIN OF CUSTODY RECORD

[illegible]

ANALYTICAL DATA PACKAGE
Applied Chromatography Section

CLIENT: VERSAR DIV 61
SITE: YORKTOWN
CODE-BATCH: VERSYORK - 1
CONTROL #: 5819
VERSAR #: 5380.001.01
DATE: 30-DEC-91
BTEX BY 8020

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories, Inc. utilizes only USEPA approved analytical methods and instrumentation. The analytical methods used in the analyses of these samples are listed below.

<u>Parameters</u>	<u>Methods</u>
Organics:	
Aromatic Volatile Compounds	SW846 8020

SW: SW846-Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, EPA, September, 1986.

COMPANY: VERSAR INC.
LAB #: 4200-40441
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64380 11-12-91 14:00

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.2
Toluene	ND	1.2
Ethylbenzene	ND	1.2
Xylenes	ND	1.2

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	102

COMPANY : VERSAR INC.
LAB #: 4200-40441
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64380 11-12-91 14:00

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	16	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40442
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64383 11-12-91 14:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.3
Toluene	ND	1.3
Ethylbenzene	ND	1.3
Xylenes	ND	1.3

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	82

COMPANY : VERSAR INC.
LAB #: 4200-40442
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64383 11-12-91 14:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	22	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40443
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64384 11-12-91 14:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.3
Toluene	ND	1.3
Ethylbenzene	ND	1.3
Xylenes	ND	1.3

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	81

COMPANY : VERSAR INC.
LAB #: 4200-40443
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64384 11-12-91 14:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	22	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40444
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64389 11-12-91 15:10

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.2
Toluene	ND	1.2
Ethylbenzene	ND	1.2
Xylenes	ND	1.2

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	118

COMPANY : VERSAR INC.
LAB #: 4200-40444
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64389 11-12-91 15:10

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	16	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40445
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64392 11-12-91 15:10

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.2
Toluene	ND	1.2
Ethylbenzene	ND	1.2
Xylenes	ND	1.2

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	82

COMPANY : VERSAR INC.
LAB #: 4200-40445
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64392 11-12-91 15:10

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	20	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40446
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64395 11-12-91 16:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.1
Toluene	ND	1.1
Ethylbenzene	ND	1.1
Xylenes	ND	1.1

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	93

COMPANY : VERSAR INC.
LAB #: 4200-40446
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64395 11-12-91 16:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Percent Water	11/21/91	12		%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40447
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64398 11-13-91 12:20

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.1
Toluene	ND	1.1
Ethylbenzene	ND	1.1
Xylenes	ND	1.1

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	91

COMPANY : VERSAR INC.
LAB #: 4200-40447
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64398 11-13-91 12:20

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	13	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40448
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/25/91
DATE ANALYZED: 11/25/91

SAMPLE ID: 64401 11-13-91 14:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.4
Toluene	ND	1.4
Ethylbenzene	ND	1.4
Xylenes	ND	1.4

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	80

COMPANY : VERSAR INC.
LAB #: 4200-40448
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64401 11-13-91 14:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	28	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40449
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64404 11-13-91 14:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.4
Toluene	ND	1.4
Ethylbenzene	ND	1.4
Xylenes	ND	1.4

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	88

COMPANY : VERSAR INC.
LAB #: 4200-40449
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64404 11-13-91 14:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	27	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40450
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64407 11-14-91 14:40

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.1
Toluene	ND	1.1
Ethylbenzene	ND	1.1
Xylenes	ND	1.1

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	103

COMPANY : VERSAR INC.
LAB #: 4200-40450
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64407 11-14-91 14:40

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	12	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40451
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64410 11-14-91 16:10

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.2
Toluene	ND	1.2
Ethylbenzene	ND	1.2
Xylenes	ND	1.2

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	Interference

COMPANY : VERSAR INC.
LAB #: 4200-40451
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64410 11-14-91 16:10

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	16	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40452
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64413 11-14-91 16:10

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.3
Toluene	ND	1.3
Ethylbenzene	ND	1.3
Xylenes	ND	1.3

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	85

COMPANY : VERSAR INC.
LAB #: 4200-40452
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64413 11-14-91 16:10

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	24	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40453
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64416 11-15-91 10:45

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.1
Toluene	ND	1.1
Ethylbenzene	ND	1.1
Xylenes	ND	1.1

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	100

COMPANY : VERSAR INC.
LAB #: 4200-40453
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64416 11-15-91 10:45

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	11	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40454
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64419 11-15-91 12:45

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.4
Toluene	ND	1.4
Ethylbenzene	ND	1.4
Xylenes	2.9	1.4

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	90

COMPANY : VERSAR INC.
LAB #: 4200-40454
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64419 11-15-91 12:45

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	27	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40455
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64422 11-15-91 12:45

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.4
Toluene	ND	1.4
Ethylbenzene	ND	1.4
Xylenes	ND	1.4

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	80

COMPANY : VERSAR INC.
LAB #: 4200-40455
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64422 11-15-91 12:45

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	30	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40456
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64425 11-15-91 15:30

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.1
Toluene	ND	1.1
Ethylbenzene	ND	1.1
Xylenes	ND	1.1

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	72

COMPANY : VERSAR INC.
LAB #: 4200-40456
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64425 11-15-91 15:30

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	7.1	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40457
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64428 11-15-91 16:20

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.3
Toluene	ND	1.3
Ethylbenzene	ND	1.3
Xylenes	ND	1.3

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	120

COMPANY : VERSAR INC.
LAB #: 4200-40457
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64428 11-15-91 16:20

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	21	%

NOTE: ND (None Detected)

COMPANY: VERSAR INC.
LAB #: 4200-40458
MATRIX: SOLID

DATE RECEIVED: 11/21/91
DATE EXTRACTED: 11/26/91
DATE ANALYZED: 11/26/91

SAMPLE ID: 64431 11-15-91 16:20

AROMATIC VOLATILE COMPOUNDS — METHOD 8020

PARAMETER	RESULT (ug/kg)	DETECTION LIMIT
Benzene	ND	1.3
Toluene	ND	1.3
Ethylbenzene	ND	1.3
Xylenes	ND	1.3

NOTE: ND (None Detected) dry weight
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	70

COMPANY : VERSAR INC.
LAB #: 4200-40458
MATRIX : SOLID

DATE RECEIVED: 11/21/91

SAMPLE ID : 64431 11-15-91 16:20

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Percent Water	11/21/91	24	%

NOTE: ND (None Detected)

PROJECT NO. 5819		PROJECT NAME VERSYORK					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		Y N										
SAMPLERS: (Signature)					(Printed)					NO. OF CONTAINERS BTEX by 8020 w/sec. Col. Conf. at Lab's Discretion										REMARKS Control #5819 Sample #									
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION																								
64380	11/12	1400			Do ms/ms on this Sample					1	X								66705										
64383		1430								1	X								66706										
64384		1430								1	X								66707										
64389		1510								1	X								66708										
64392		1510								1	X								66709										
64395		1630								1	X								66710										
64398	11/13	1220								1	X								66711										
64401		1430								1	X								66712										
64404		1430								1	X								66713										
64407	11/14	1430								1	X								66714										
64410		1610								1	X								66715										
64413		1610								1	X								66716										
Relinquished by: (Signature) Shula Maguire					Date / Time 11/20/91 1400					Received by: (Signature)					Relinquished by: (Signature)					Date / Time					Received by: (Signature)				
(Printed)										(Printed)					(Printed)										(Printed)				
Relinquished by: (Signature)					Date / Time					Received for Laboratory by: (Signature) [Signature]					Date / Time 11-21-91 11:30					Remarks: Full Report w/ All Raw Data. Need 2 Copies of this to Shula Maguire by December 16, 1991 Do GC on designated sample									
(Printed)										(Printed)																			

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

ANALYTICAL DATA PACKAGE
General Chemistry Section

CLIENT: VERSAR DIV 61
SITE: YORKTOWN
CODE-BATCH: VERSYORK - 1
CONTROL #: 5819
VERSAR #: 5380.001.01
DATE: 23-DEC-91
EOX,TRPH

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Versar, Inc.
Project: VersYork/#5819
Sample Matrix: Soil

Date Received: 11/26/91
Date Extracted: 11/29/91
Date Analyzed: 12/12/91
Work Order #: K916920

Extractable Organic Halides (EOX)
EPA Modified 9020*
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
66722	K6920-1	**12	ND
66723	K6920-2	15	15
66724	K6920-3	14	ND
66725	K6920-4	14	ND
66726	K6920-5	14	ND
66727	K6920-6	14	ND
66728	K6920-7	13	ND
66729	K6920-8	18	ND
66730	K6920-9	15	ND
66731	K6920-10	15	ND

* Ethyl Acetate extraction followed by Oxygen Bomb Combustion and analysis by Coulometric Titration (Haake-Buchler Digital Chloridometer).

MRL Method Reporting Limit

** Result reported on an As Received Basis because insufficient sample remained to perform total solids.

ND None Detected at or above the method reporting limit

Approved by

Anne Spelma

Date

1/1/92

00001

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Versar, Inc.
Project: VersYork/#5819
Sample Matrix: Soil

Date Received: 11/26/91
Date Extracted: 11/29/91
Date Analyzed: 12/12/91
Work Order #: K916920

Extractable Organic Halides (EOX)
EPA Modified 9020*
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
66732	K6920-11	15	ND
66733	K6920-12	15	ND
66734	K6920-13	13	ND
66735	K6920-14	16	ND
66736	K6920-15	17	ND
66737	K6920-16	16	ND
66738	K6920-17	16	ND
66757	K6920-18	14	ND
Method Blank	K6920-MB	12	ND

* Ethyl Acetate extraction followed by Oxygen Bomb Combustion and analysis by Coulometric Titration (Haake-Buchler Digital Chloridometer).

MRL Method Reporting Limit

ND None Detected at or above the method reporting limit

Approved by arni Aprilina Date 12/16/91

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Versar, Inc.
Project: VersYork/#5819
Sample Matrix: Soil

Date Received: 11/26/91
Date Extracted: 12/03/91
Date Analyzed: 12/03/91
Work Order #: K916920

Total Recoverable Petroleum Hydrocarbons
SM Method 5520E/EPA Method 418.1
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
66722	K6920-1	*50	ND
66723	K6920-2	25	ND
66724	K6920-3	25	ND
66725	K6920-4	25	ND
66726	K6920-5	25	ND
66727	K6920-6	25	ND
66728	K6920-7	25	ND
66729	K6920-8	**50	ND
66730	K6920-9	**50	ND
66731	K6920-10	25	ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
MRL Method Reporting Limit
* Elevated MRL because the sample required dilution.
ND None Detected at or above the method reporting limit
** Elevated MRL because there was insufficient sample quantity for optimum analysis.
Also, reported on an As Received Basis because not enough sample for TS.

Approved by Ami Spielman Date 12/16/91

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Versar, Inc.
Project: VersYork/#5819
Sample Matrix: Soil

Date Received: 11/26/91
Date Extracted: 12/03/91
Date Analyzed: 12/03/91
Work Order #: K916920

Total Recoverable Petroleum Hydrocarbons
SM Method 5520E/EPA Method 418.1
mg/Kg (ppm)
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
66732	K6920-11	25	ND
66733	K6920-12	25	ND
66734	K6920-13	25	ND
66735	K6920-14	25	ND
66736	K6920-15	25	ND
66737	K6920-16	25	ND
66738	K6920-17	25	ND
66757	K6920-18	25	ND
Method Blank	K6920-MB	25	ND

SM Standard Methods for the Examination of Water and Wastewater, 17th Ed., 1989
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Amie Spielman Date 12/16/91

00004

Page 1 of 2

PROJECT NO. 5819		PROJECT NAME Versar York		PARAMETERS		INDUSTRIAL HYGIENE SAMPLE		Y	
SAMPLERS: (Signature)		(Printed)		NO. OF CONTAINERS		STATION LOCATION		REMARKS	
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	NO. OF CONTAINERS	STATION LOCATION	REMARKS	Y	N
64381	11/12	1400			1	DO's on this sample	Control # 5819 Sample #15		
64385	11/12	1430			1		66722		
64386	11/12	1430			1		66723		
64390	11/12	1510			1		66724		
64393	11/12	1510			1		66725		
64396	11/12	1630			1		66726		
64399	11/13	1220			1		66727		
64402	11/13	1430			1		66728		
64405	11/13	1430			1		66729		
64408	11/14	1440			1		66730		
64411	11/14	1610			1		66731		
64414	11/14	1610			1		66732		
					1		66733		
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Relinquished by: (Signature)	
Shirley Maguire		11/15/10 0200 PM							
(Printed)				(Printed)				(Printed)	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks	
				Shirley Maguire		11/26/91		Full Report w/ Raw Data 1000 Copies to Shirley Maguire by December 16, 1991. DO QC on designated sample.	
(Printed)				(Printed)					

00010

PROJECT NO. 5819		PROJECT NAME Vers York					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		Y N										
SAMPLERS: (Signature)					(Printed)					<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> NO. OF CONTAINERS PET# by 4181 COX by 4481-008 </div>										REMARKS Control # 5819 Sample #5									
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION																								
64417	11/15	1045								1	X	X						66734											
64420	1	1245								1	X	X						66735											
64423	1	1245								1	X	X						66736											
64429	1	1620								1	X	X						66737											
64432	1	1620								1	X	X						66738											
64426	1	1530								1	X	X						66757											
Relinquished by: (Signature) Shula McGuire					Date / Time 11/25/91 0200PM					Received by: (Signature)					Relinquished by: (Signature)					Date / Time					Received by: (Signature)				
(Printed)										(Printed)					(Printed)										(Printed)				
Relinquished by: (Signature)					Date / Time					Received for Laboratory by: (Signature)					Date / Time					Remarks									
(Printed)										Anne Fack					11/26/91					Full copy of Report w/ Raw Data Need 2 copies to Shula McGuire by December 16, 1991.									

D

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64381

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66722

Sample wt/vol: 30.07 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 14.30 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: __4.3 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

CAS NO.

COMPOUND

g

319-84-6	alpha-BHC	2.3	10
319-85-7	beta-BHC	2.3	10
319-86-8	delta-BHC	2.3	10
58-89-9	gamma-BHC (Lindane)	2.3	10
76-44-8	Heptachlor	2.3	10
309-00-2	Aldrin	2.3	10
1024-57-3	Heptachlor Epoxide	2.3	10
959-98-8	Endosulfan I	2.3	10
60-57-1	Dieldrin	4.7	10
72-55-9	4,4'-DDE	4.7	10
72-20-8	Endrin	4.7	10
33213-65-9	Endosulfan II	4.7	10
72-54-8	4,4'-DDD	4.7	10
1031-07-8	Endosulfan Sulfate	4.7	10
50-29-3	4,4'-DDT	4.7	10
72-43-5	Methoxychlor	23	10
53494-70-5	Endrin Ketone	4.7	10
5103-71-9	alpha-Chlordane	23	10
5103-74-2	gamma-Chlordane	23	10
8001-35-2	Toxaphene	47	10
12674-11-2	Aroclor-1016	23	10
11104-28-2	Aroclor-1221	23	10
11141-16-5	Aroclor-1232	23	10
53469-21-9	Aroclor-1242	23	10
12672-29-6	Aroclor-1248	23	10
11097-69-1	Aroclor-1254	47	10
11096-82-5	Aroclor-1260	47	10

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FORM I PEST

1/87 Rev.

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EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

64385

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66723

Sample wt/vol: 30.04 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 20.90 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____4.1 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) _UG/KG Q

D

319-84-6	alpha-BHC	2.5	10
319-85-7	beta-BHC	2.5	10
319-86-8	delta-BHC	2.5	10
58-89-9	gamma-BHC (Lindane)	2.5	10
76-44-8	Heptachlor	2.5	10
309-00-2	Aldrin	2.5	10
1024-57-3	Heptachlor Epoxide	2.5	10
959-98-8	Endosulfan I	2.5	10
60-57-1	Dieldrin	5.1	10
72-55-9	4,4'-DDE	5.1	10
72-20-8	Endrin	5.1	10
33213-65-9	Endosulfan II	5.1	10
72-54-8	4,4'-DDD	5.1	10
1031-07-8	Endosulfan Sulfate	5.1	10
50-29-3	4,4'-DDT	5.1	10
72-43-5	Methoxychlor	25	10
53494-70-5	Endrin Ketone	5.1	10
5103-71-9	alpha-Chlordane	25	10
5103-74-2	gamma-Chlordane	25	10
8001-35-2	Toxaphene	51	10
12674-11-2	Aroclor-1016	25	10
11104-28-2	Aroclor-1221	25	10
11141-16-5	Aroclor-1232	25	10
53469-21-9	Aroclor-1242	25	10
12672-29-6	Aroclor-1248	25	10
11097-69-1	Aroclor-1254	51	10
11096-82-5	Aroclor-1260	51	10

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64386

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66724

Sample wt/vol: 30.10 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 21.10 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____4.2 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

D

CAS NO.	COMPOUND	Q
319-84-6	alpha-BHC	2.5 IU
319-85-7	beta-BHC	2.5 IU
319-86-8	delta-BHC	2.5 IU
58-89-9	gamma-BHC (Lindane)	2.5 IU
76-44-8	Heptachlor	2.5 IU
309-00-2	Aldrin	2.5 IU
1024-57-3	Heptachlor Epoxide	2.5 IU
959-98-8	Endosulfan I	2.5 IU
60-57-1	Dieldrin	5.1 IU
72-55-9	4,4'-DDE	5.1 IU
72-20-8	Endrin	5.1 IU
33213-65-9	Endosulfan II	5.1 IU
72-54-8	4,4'-DDD	5.1 IU
1031-07-8	Endosulfan Sulfate	5.1 IU
50-29-3	4,4'-DDT	5.1 IU
72-43-5	Methoxychlor	25 IU
53494-70-5	Endrin Ketone	5.1 IU
5103-71-9	alpha-Chlordane	25 IU
5103-74-2	gamma-Chlordane	25 IU
8001-35-2	Toxaphene	51 IU
12674-11-2	Aroclor-1016	25 IU
11104-28-2	Aroclor-1221	25 IU
11141-16-5	Aroclor-1232	25 IU
53469-21-9	Aroclor-1242	25 IU
12672-29-6	Aroclor-1248	25 IU
11097-69-1	Aroclor-1254	51 IU
11096-82-5	Aroclor-1260	51 IU

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FORM I PEST

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100019

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64390

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66725

Sample wt/vol: 30.07 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 10.00 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: _____ 5.2 Dilution Factor: 1.0

D	CAS NO.	COMPOUND	CONCENTRATION UNITS:	
			(ug/L or ug/Kg)	UG/KG
	319-84-6	alpha-BHC	2.2	10
	319-85-7	beta-BHC	2.2	10
	319-86-8	delta-BHC	2.2	10
	58-89-9	gamma-BHC (Lindane)	2.2	10
	76-44-8	Heptachlor	2.2	10
	309-00-2	Aldrin	2.2	10
	1024-57-3	Heptachlor Epoxide	2.2	10
	959-98-8	Endosulfan I	2.2	10
	60-57-1	Dieldrin	4.4	10
	72-55-9	4,4'-DDE	4.4	10
	72-20-8	Endrin	4.4	10
	33213-65-9	Endosulfan II	4.4	10
	72-54-8	4,4'-DDD	4.4	10
	1031-07-8	Endosulfan Sulfate	4.4	10
	50-29-3	4,4'-DDT	4.4	10
	72-43-5	Methoxychlor	22	10
	53494-70-5	Endrin Ketone	4.4	10
	5103-71-9	alpha-Chlordane	22	10
	5103-74-2	gamma-Chlordane	22	10
	8001-35-2	Toxaphene	44	10
	12674-11-2	Aroclor-1016	22	10
	11104-28-2	Aroclor-1221	22	10
	11141-16-5	Aroclor-1232	22	10
	53469-21-9	Aroclor-1242	22	10
	12672-29-6	Aroclor-1248	22	10
	11097-69-1	Aroclor-1254	44	10
	11096-82-5	Aroclor-1260	44	10

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64393

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66726

Sample wt/vol: 30.04 G Lab File ID: _____

Level: (low/med) __LDW__ Date Received: __11/18/91

% Moisture: not dec. 8.90 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____5.2 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

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CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) _UG/KG	g
319-84-6	alpha-BHC	2.2	10
319-85-7	beta-BHC	2.2	10
319-86-8	delta-BHC	2.2	10
58-89-9	gamma-BHC (Lindane)	2.2	10
76-44-8	Heptachlor	2.2	10
309-00-2	Aldrin	2.2	10
1024-57-3	Heptachlor Epoxide	2.2	10
959-98-8	Endosulfan I	2.2	10
60-57-1	Dieldrin	4.4	10
72-55-9	4,4'-DDE	4.4	10
72-20-8	Endrin	4.4	10
33213-65-9	Endosulfan II	4.4	10
72-54-8	4,4'-DDD	4.4	10
1031-07-8	Endosulfan Sulfate	4.4	10
50-29-3	4,4'-DDT	4.4	10
72-43-5	Methoxychlor	22	10
53494-70-5	Endrin Ketone	4.4	10
5103-71-9	alpha-Chlordane	22	10
5103-74-2	gamma-Chlordane	22	10
8001-35-2	Toxaphene	44	10
12674-11-2	Aroclor-1016	22	10
11104-28-2	Aroclor-1221	22	10
11141-16-5	Aroclor-1232	22	10
53469-21-9	Aroclor-1242	22	10
12672-29-6	Aroclor-1248	22	10
11097-69-1	Aroclor-1254	44	10
11096-82-5	Aroclor-1260	44	10

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64396

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66727

Sample wt/vol: 30.03 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 17.10 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: _____ 5.3 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) _UG/KG Q

D

319-84-6	alpha-BHC	2.4	10
319-85-7	beta-BHC	2.4	10
319-86-8	delta-BHC	2.4	10
58-89-9	gamma-BHC (Lindane)	2.4	10
76-44-8	Heptachlor	2.4	10
309-00-2	Aldrin	2.4	10
1024-57-3	Heptachlor Epoxide	2.4	10
959-98-8	Endosulfan I	2.4	10
60-57-1	Dieldrin	4.8	10
72-55-9	4,4'-DDE	4.8	10
72-20-8	Endrin	4.8	10
33213-65-9	Endosulfan II	4.8	10
72-54-8	4,4'-DDO	4.8	10
1031-07-8	Endosulfan Sulfate	4.8	10
50-29-3	4,4'-DDT	4.8	10
72-43-5	Methoxychlor	24	10
53494-70-5	Endrin Ketone	4.8	10
5103-71-9	alpha-Chlordane	24	10
5103-74-2	gamma-Chlordane	24	10
8001-35-2	Toxaphene	48	10
12674-11-2	Aroclor-1016	24	10
11104-28-2	Aroclor-1221	24	10
11141-16-5	Aroclor-1232	24	10
53469-21-9	Aroclor-1242	24	10
12672-29-6	Aroclor-1248	24	10
11097-69-1	Aroclor-1254	48	10
11096-82-5	Aroclor-1260	48	10

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64399

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66728

Sample wt/vol: 30.08 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 10.80 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____5.9 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) _UG/KG Q

D

319-84-6	alpha-BHC	2.2	1U
319-85-7	beta-BHC	2.2	1U
319-86-8	delta-BHC	2.2	1U
58-89-9	gamma-BHC (Lindane)	2.2	1U
76-44-8	Heptachlor	2.2	1U
309-00-2	Aldrin	2.2	1U
1024-57-3	Heptachlor Epoxide	2.2	1U
959-98-8	Endosulfan I	2.2	1U
60-57-1	Dieldrin	4.5	1U
72-55-9	4,4'-DDE	4.5	1U
72-20-8	Endrin	4.5	1U
33213-65-9	Endosulfan II	4.5	1U
72-54-8	4,4'-DDD	4.5	1U
1031-07-8	Endosulfan Sulfate	4.5	1U
50-29-3	4,4'-DDT	4.5	1U
72-43-5	Methoxychlor	22	1U
53494-70-5	Endrin Ketone	4.5	1U
5103-71-9	alpha-Chlordane	22	1U
5103-74-2	gamma-Chlordane	22	1U
8001-35-2	Toxaphene	45	1U
12674-11-2	Aroclor-1016	22	1U
11104-28-2	Aroclor-1221	22	1U
11141-16-5	Aroclor-1232	22	1U
53469-21-9	Aroclor-1242	22	1U
12672-29-6	Aroclor-1248	22	1U
11097-69-1	Aroclor-1254	45	1U
11096-82-5	Aroclor-1260	45	1U

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64402

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66729

Sample wt/vol: 30.02 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 33.30 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: __6.4 Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

319-84-6	alpha-BHC	3.0	U
319-85-7	beta-BHC	3.0	U
319-86-8	delta-BHC	3.0	U
58-89-9	gamma-BHC (Lindane)	3.0	U
76-44-8	Heptachlor	3.0	U
309-00-2	Aldrin	3.0	U
1024-57-3	Heptachlor Epoxide	3.0	U
959-98-8	Endosulfan I	3.0	U
60-57-1	Dieldrin	6.0	U
72-55-9	4,4'-DDE	6.0	U
72-20-8	Endrin	6.0	U
33213-65-9	Endosulfan II	6.0	U
72-54-8	4,4'-DDD	6.0	U
1031-07-8	Endosulfan Sulfate	6.0	U
50-29-3	4,4'-DDT	6.0	U
72-43-5	Methoxychlor	30	U
53494-70-5	Endrin Ketone	6.0	U
5103-71-9	alpha-Chlordane	30	U
5103-74-2	gamma-Chlordane	30	U
8001-35-2	Toxaphene	60	U
12674-11-2	Aroclor-1016	30	U
11104-28-2	Aroclor-1221	30	U
11141-16-5	Aroclor-1232	30	U
53469-21-9	Aroclor-1242	30	U
12672-29-6	Aroclor-1248	30	U
11097-69-1	Aroclor-1254	60	U
11096-82-5	Aroclor-1260	60	U

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64405

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66730

Sample wt/vol: 30.01 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 33.90 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____5.0 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

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CAS NO.	COMPOUND	Q
319-84-6	alpha-BHC	3.0 IU
319-85-7	beta-BHC	3.0 IU
319-86-8	delta-BHC	3.0 IU
58-89-9	gamma-BHC (Lindane)	3.0 IU
76-44-8	Heptachlor	3.0 IU
309-00-2	Aldrin	3.0 IU
1024-57-3	Heptachlor Epoxide	3.0 IU
959-98-8	Endosulfan I	3.0 IU
60-57-1	Dieldrin	6.1 IU
72-55-9	4,4'-DDE	6.1 IU
72-20-8	Endrin	6.1 IU
33213-65-9	Endosulfan II	6.1 IU
72-54-8	4,4'-DDD	6.1 IU
1031-07-8	Endosulfan Sulfate	6.1 IU
50-29-3	4,4'-DDT	6.1 IU
72-43-5	Methoxychlor	30 IU
53494-70-5	Endrin Ketone	6.1 IU
5103-71-9	alpha-Chlordane	30 IU
5103-74-2	gamma-Chlordane	30 IU
8001-35-2	Toxaphene	61 IU
12674-11-2	Aroclor-1016	30 IU
11104-28-2	Aroclor-1221	30 IU
11141-16-5	Aroclor-1232	30 IU
53469-21-9	Aroclor-1242	30 IU
12672-29-6	Aroclor-1248	30 IU
11097-69-1	Aroclor-1254	61 IU
11096-82-5	Aroclor-1260	61 IU

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64408

Lab Name: _____ VERSAR, INC. _____ Contract: _____

Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66731

Sample wt/vol: 30.06 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 11.90 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: __5.2 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

CAS NO. COMPOUND

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) _UG/KG	Q
319-84-6	alpha-BHC	2.3	10
319-85-7	beta-BHC	2.3	10
319-86-8	delta-BHC	2.3	10
58-89-9	gamma-BHC (Lindane)	2.3	10
76-44-8	Heptachlor	2.3	10
309-00-2	Aldrin	2.3	10
1024-57-3	Heptachlor Epoxide	2.3	10
959-98-8	Endosulfan I	2.3	10
60-57-1	Dieldrin	4.5	10
72-55-9	4,4'-DDE	4.5	10
72-20-8	Endrin	4.5	10
33213-65-9	Endosulfan II	4.5	10
72-54-8	4,4'-DDD	4.5	10
1031-07-8	Endosulfan Sulfate	4.5	10
50-29-3	4,4'-DDT	4.5	1
72-43-5	Methoxychlor	23	10
53494-70-5	Endrin Ketone	4.5	10
5103-71-9	alpha-Chlordane	23	10
5103-74-2	gamma-Chlordane	23	10
8001-35-2	Toxaphene	45	10
12674-11-2	Aroclor-1016	23	10
11104-28-2	Aroclor-1221	23	10
11141-16-5	Aroclor-1232	23	10
53469-21-9	Aroclor-1242	23	10
12672-29-6	Aroclor-1248	23	10
11097-69-1	Aroclor-1254	45	10
11096-82-5	Aroclor-1260	45	10

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64411

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water)SOIL Lab Sample ID: __66732

Sample wt/vol: 30.03 G Lab File ID: _____

Level: (low/med) __LDW__ Date Received: __11/18/91

% Moisture: not dec. 20.10 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: _____8.3 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) _UG/KG Q

D

319-84-6	alpha-BHC	2.5	1U
319-85-7	beta-BHC	2.5	1U
319-86-8	delta-BHC	2.5	1U
58-89-9	gamma-BHC (Lindane)	2.5	1U
76-44-8	Heptachlor	2.5	1U
309-00-2	Aldrin	2.5	1U
1024-57-3	Heptachlor Epoxide	2.5	1U
959-98-8	Endosulfan I	2.5	1U
60-57-1	Dieldrin	5.0	1U
72-55-9	4,4'-DDE	5.0	1U
72-20-8	Endrin	5.0	1U
33213-65-9	Endosulfan II	5.0	1U
72-54-8	4,4'-DDD	5.0	1U
1031-07-8	Endosulfan Sulfate	5.0	1U
50-29-3	4,4'-DDT	5.0	1U
72-43-5	Methoxychlor	25	1U
53494-70-5	Endrin Ketone	5.0	1U
5103-71-9	alpha-Chlordane	25	1U
5103-74-2	gamma-Chlordane	25	1U
8001-35-2	Toxaphene	50	1U
12674-11-2	Aroclor-1016	25	1U
11104-28-2	Aroclor-1221	25	1U
11141-16-5	Aroclor-1232	25	1U
53469-21-9	Aroclor-1242	25	1U
12672-29-6	Aroclor-1248	25	1U
11097-69-1	Aroclor-1254	50	1U
11096-82-5	Aroclor-1260	50	1U

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64414

Lab Name: _____ VERSAR, INC. _____ Contract: _____

I Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66733

Sample wt/vol: 30.06 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 20.50 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: _____ 8.2 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

D

CAS NO.	COMPOUND	Q
319-84-6	alpha-BHC	2.5 IU
319-85-7	beta-BHC	2.5 IU
319-86-8	delta-BHC	2.5 IU
58-89-9	gamma-BHC (Lindane)	2.5 IU
76-44-8	Heptachlor	2.5 IU
309-00-2	Aldrin	2.5 IU
1024-57-3	Heptachlor Epoxide	2.5 IU
959-98-8	Endosulfan I	2.5 IU
60-57-1	Dieldrin	5.0 IU
72-55-9	4,4'-DDE	5.0 IU
72-20-8	Endrin	5.0 IU
33213-65-9	Endosulfan II	5.0 IU
72-54-8	4,4'-DDD	5.0 IU
1031-07-8	Endosulfan Sulfate	5.0 IU
50-29-3	4,4'-DDT	5.0 IU
72-43-5	Methoxychlor	25 IU
53494-70-5	Endrin Ketone	5.0 IU
5103-71-9	alpha-Chlordane	25 IU
5103-74-2	gamma-Chlordane	25 IU
8001-35-2	Toxaphene	50 IU
12674-11-2	Aroclor-1016	25 IU
11104-28-2	Aroclor-1221	25 IU
11141-16-5	Aroclor-1232	25 IU
53469-21-9	Aroclor-1242	25 IU
12672-29-6	Aroclor-1248	25 IU
11097-69-1	Aroclor-1254	50 IU
11096-82-5	Aroclor-1260	50 IU

KD 12/11/91

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64417

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66734

Sample wt/vol: 30.08 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 7.80 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: _____ 5.8 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG Q

CAS NO.

COMPOUND

Q

319-84-6	alpha-BHC	2.2	1U
319-85-7	beta-BHC	2.2	1U
319-86-8	delta-BHC	2.2	1U
58-89-9	gamma-BHC (Lindane)	2.2	1U
76-44-8	Heptachlor	2.2	1U
309-00-2	Aldrin	2.2	1U
1024-57-3	Heptachlor Epoxide	2.2	1U
959-98-8	Endosulfan I	2.2	1U
60-57-1	Dieldrin	4.3	1U
72-55-9	4,4'-DDE	4.3	1U
72-20-8	Endrin	4.3	1U
33213-65-9	Endosulfan II	4.3	1U
72-54-8	4,4'-DDD	4.3	1U
1031-07-8	Endosulfan Sulfate	4.3	1U
50-29-3	4,4'-DDT	4.3	1U
72-43-5	Methoxychlor	22	1U
53494-70-5	Endrin Ketone	4.3	1U
5103-71-9	alpha-Chlordane	22	1U
5103-74-2	gamma-Chlordane	22	1U
8001-35-2	Toxaphene	43	1U
12674-11-2	Aroclor-1016	22	1U
11104-28-2	Aroclor-1221	22	1U
11141-16-5	Aroclor-1232	22	1U
53469-21-9	Aroclor-1242	22	1U
12672-29-6	Aroclor-1248	22	1U
11097-69-1	Aroclor-1254	43	1U
11096-82-5	Aroclor-1260	43	1U

KO 12/11/91

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64420

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66735

Sample wt/vol: 30.06 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 26.00 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: ____8.0 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG

CAS NO.

COMPOUND

Q

319-84-6	alpha-BHC	2.7	1U
319-85-7	beta-BHC	2.7	1U
319-86-8	delta-BHC	2.7	1U
58-89-9	gamma-BHC (Lindane)	2.7	1U
76-44-8	Heptachlor	2.7	1U
309-00-2	Aldrin	2.7	1U
1024-57-3	Heptachlor Epoxide	2.7	1U
959-98-8	Endosulfan I	2.7	1U
60-57-1	Dieldrin	5.4	1U
72-55-9	4,4'-DDE	5.4	1U
72-20-8	Endrin	5.4	1U
33213-65-9	Endosulfan II	5.4	1U
72-54-8	4,4'-DDD	5.4	1U
1031-07-8	Endosulfan Sulfate	5.4	1U
50-29-3	4,4'-DDT	5.4	1U
72-43-5	Methoxychlor	27	1U
53494-70-5	Endrin Ketone	5.4	1U
5103-71-9	alpha-Chlordane	27	1U
5103-74-2	gamma-Chlordane	27	1U
8001-35-2	Toxaphene	54	1U
12674-11-2	Aroclor-1016	27	1U
11104-28-2	Aroclor-1221	27	1U
11141-16-5	Aroclor-1232	27	1U
53469-21-9	Aroclor-1242	27	1U
12672-29-6	Aroclor-1248	27	1U
11097-69-1	Aroclor-1254	54	1U
11096-82-5	Aroclor-1260	54	1U

KC 12/11/91

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64423

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66736

Sample wt/vol: 30.08 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 25.20 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/04/91

GPC Cleanup: (Y/N) __N__ pH: __8.2 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

D

319-84-6	alpha-BHC	2.7	10
319-85-7	beta-BHC	2.7	10
319-86-8	delta-BHC	2.7	10
58-89-9	gamma-BHC (Lindane)	2.7	10
76-44-8	Heptachlor	2.7	10
309-00-2	Aldrin	2.7	10
1024-57-3	Heptachlor Epoxide	2.7	10
959-98-8	Endosulfan I	2.7	10
60-57-1	Dieldrin	5.3	10
72-55-9	4,4'-DDE	5.3	10
72-20-8	Endrin	5.3	10
33213-65-9	Endosulfan II	5.3	10
72-54-8	4,4'-DDD	5.3	10
1031-07-8	Endosulfan Sulfate	5.3	10
50-29-3	4,4'-DDT	5.3	10
72-43-5	Methoxychlor	27	10
53494-70-5	Endrin Ketone	5.3	10
5103-71-9	alpha-Chlordane	27	10
5103-74-2	gamma-Chlordane	27	10
8001-35-2	Toxaphene	53	10
12674-11-2	Aroclor-1016	27	10
11104-28-2	Aroclor-1221	27	10
11141-16-5	Aroclor-1232	27	10
53469-21-9	Aroclor-1242	27	10
12672-29-6	Aroclor-1248	27	10
11097-69-1	Aroclor-1254	53	10
11096-82-5	Aroclor-1260	53	10

12/11/91

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64429

Lab Name: _____ VERSAR, INC. _____ Contract: _____

Lab Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66737

Sample wt/vol: 30.04 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 22.00 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) ____SOXH Date Analyzed: __12/05/91

GPC Cleanup: (Y/N) __N__ pH: ____8.4 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) _UG/KG Q

D

319-84-6	alpha-BHC	2.6	10
319-85-7	beta-BHC	2.6	10
319-86-8	delta-BHC	2.6	10
58-89-9	gamma-BHC (Lindane)	2.6	10
76-44-8	Heptachlor	2.6	10
309-00-2	Aldrin	2.6	10
1024-57-3	Heptachlor Epoxide	2.6	10
959-98-8	Endosulfan I	2.6	10
60-57-1	Dieldrin	5.1	10
72-55-9	4,4'-DDE	5.1	10
72-20-8	Endrin	5.1	10
33213-65-9	Endosulfan II	5.1	10
72-54-8	4,4'-DDD	5.1	10
1031-07-8	Endosulfan Sulfate	5.1	10
50-29-3	4,4'-DDT	5.1	10
72-43-5	Methoxychlor	26	10
53494-70-5	Endrin Ketone	5.1	10
5103-71-9	alpha-Chlordane	26	10
5103-74-2	gamma-Chlordane	26	10
8001-35-2	Toxaphene	51	10
12674-11-2	Aroclor-1016	26	10
11104-28-2	Aroclor-1221	26	10
11141-16-5	Aroclor-1232	26	10
53469-21-9	Aroclor-1242	26	10
12672-29-6	Aroclor-1248	26	10
11097-69-1	Aroclor-1254	51	10
11096-82-5	Aroclor-1260	51	10

20 12/11/91

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64432

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL

Lab Sample ID: __66738

Sample wt/vol: 30.09 G

Lab File ID: _____

Level: (low/med) __LDW__

Date Received: __11/18/91

% Moisture: not dec. 22.00 dec. _____

Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH

Date Analyzed: __12/05/91

GPC Cleanup: (Y/N) __N__ pH: _____ 8.3 Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG g

CAS NO.

COMPOUND

319-84-6	alpha-BHC	2.6	1U
319-85-7	beta-BHC	2.6	1U
319-86-8	delta-BHC	2.6	1U
58-89-9	gamma-BHC (Lindane)	2.6	1U
76-44-8	Heptachlor	2.6	1U
309-00-2	Aldrin	2.6	1U
1024-57-3	Heptachlor Epoxide	2.6	1U
959-98-8	Endosulfan I	2.6	1U
60-57-1	Dieldrin	5.1	1U
72-55-9	4,4'-DDE	5.1	1U
72-20-8	Endrin	5.1	1U
33213-65-9	Endosulfan II	5.1	1U
72-54-8	4,4'-DDD	5.1	1U
1031-07-8	Endosulfan Sulfate	5.1	1U
50-29-3	4,4'-DDT	5.1	1U
72-43-5	Methoxychlor	26	1U
53494-70-5	Endrin Ketone	5.1	1U
5103-71-9	alpha-Chlordane	26	1U
5103-74-2	gamma-Chlordane	26	1U
8001-35-2	Toxaphene	51	1U
12674-11-2	Aroclor-1016	26	1U
11104-28-2	Aroclor-1221	26	1U
11141-16-5	Aroclor-1232	26	1U
53469-21-9	Aroclor-1242	26	1U
12672-29-6	Aroclor-1248	26	1U
11097-69-1	Aroclor-1254	51	1U
11096-82-5	Aroclor-1260	51	1U

12/11/91

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

64426

Lab Name: _____ VERSAR, INC. _____ Contract: _____

L Code: VERSAR Case No.: VERSYORK SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: __66757

Sample wt/vol: 30.04 G Lab File ID: _____

Level: (low/med) __LOW__ Date Received: __11/18/91

% Moisture: not dec. 10.00 dec. _____ Date Extracted: __11/23/91

Extraction: (SepF/Cont/Sonc) _____ SOXH Date Analyzed: __12/05/91

GPC Cleanup: (Y/N) __N__ pH: _____ Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) _UG/KG Q

319-84-6	alpha-BHC	2.2	1U
319-85-7	beta-BHC	2.2	1U
319-86-8	delta-BHC	2.2	1U
58-89-9	gamma-BHC (Lindane)	2.2	1U
76-44-8	Heptachlor	2.2	1U
309-00-2	Aldrin	2.2	1U
1024-57-3	Heptachlor Epoxide	2.2	1U
959-98-8	Endosulfan I	2.2	1U
60-57-1	Dieldrin	4.4	1U
72-55-9	4,4'-DDE	4.4	1U
72-20-8	Endrin	4.4	1U
33213-65-9	Endosulfan II	4.4	1U
72-54-8	4,4'-DDD	4.4	1U
1031-07-8	Endosulfan Sulfate	4.4	1U
50-29-3	4,4'-DDT	4.4	1U
72-43-5	Methoxychlor	22	1U
53494-70-5	Endrin Ketone	4.4	1U
5103-71-9	alpha-Chlordane	22	1U
5103-74-2	gamma-Chlordane	22	1U
8001-35-2	Toxaphene	44	1U
12674-11-2	Aroclor-1016	22	1U
11104-28-2	Aroclor-1221	22	1U
11141-16-5	Aroclor-1232	22	1U
53469-21-9	Aroclor-1242	22	1U
12672-29-6	Aroclor-1248	22	1U
11097-69-1	Aroclor-1254	44	1U
11096-82-5	Aroclor-1260	44	1U

LD 12/11/91

110085

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG 5															Y N		
SAMPLERS: (Signature)					(Printed)					REMARKS									
Bradley J. Norton					BRADLEY J. NORTON														
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION		NO. OF CONTAINERS	BTEX (8020)	TPH (418.1)	TOTAL HALOGENS	PCB (8080)	TELE METALS							
64380	11/12	1400			Bore Hole - 1	6-8'	1	✓											
64381		1400				6-8'	1		✓	✓	✓								
64382		1400				6-8'	1					✓							
64383		1430				15-18'	1	✓											
64384		1430				15-18'	1	✓								DUP 64383			
64385		1430				15-18'	1		✓	✓	✓								
64386		1430				15-18'	1		✓	✓	✓					DUP OF 64385			
64387		1430				15-18'	1					✓							
64388		1430				15-18'	1					✓							
64389		1510			Bore Hole - 2	2'-6'-66"	1	✓											
64390		1510				2'-6'-66"	1		✓	✓	✓								
64391		1510				2'-6'-66"	1					✓							
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)									
Bradley J. Norton				BRADLEY J. NORTON															
(Printed)				(Printed)		(Printed)				(Printed)									
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 of 54											
(Printed)				(Printed)															

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME				PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		Y
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG. 5																(N)
SAMPLERS: (Signature)					(Printed)					NO. OF CONTAINERS	BTEX (8020)	TPH (418.1)	TOTAL HALOGENS	PCB (8080)	TCMP METALS			REMARKS
BULLY J. NORTON <th colspan="5">BRADLEY J. NORTON </th>					BRADLEY J. NORTON													
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION													
64392	11/12	1510			BORE HOLE - 2 2'6"-6'6"		1	✓										
64393		1510			2'6"-6'6"		1		✓	✓	✓							
64394		1510			2'6"-6'6"		1						✓					
64395		1630			23-25'		1	✓										
64396		1630			23-25'		1		✓	✓	✓							
64397		1630			23-25'		1						✓					
64398	11/13	1220			MW-4 2'-6'		1	✓										
64399		1220			2'-6'		1		✓	✓	✓							
64400		1220			2'-6'		1						✓					
64401		1430			41-45'		1	✓										
64402		1430			41-45'		1		✓	✓	✓							
64403		1430			41-45'		1						✓					

Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
BULLY J. NORTON				BRADLEY J. NORTON							
(Printed)				(Printed)		(Printed)				(Printed)	

Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 of 54	
(Printed)				(Printed)					

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME					PARAMETERS										INDUSTRIAL HYGIENE SAMPLE				
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG 5															Y N				
SAMPLERS: (Signature)					(Printed)					NO. OF CONTAINERS BTEX (8020) TPH (418.1) TOTAL HMOHOLS PCB (8080) TELP METALS										REMARKS	
BRADLEY J. NORTON					BRADLEY J. NORTON																
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION																
64404	11/13	1430			MW-4	41-45'	1	✓													
64405	↓	1430			↓	41-45'	1		✓	✓	✓										
64406	↓	1430			↓	41-45'	1						✓								
64407	11/14	1440			BH-3	8-10'	1	✓													
64408	↓	1440			↓	8-10'	1		✓	✓	✓										
64409	↓	1440			↓	8-10'	1						✓								
64410	↓	1610			↓	38-42'	1	✓													
64411	↓	1610			↓	38-42'	1		✓	✓	✓										
64412	↓	1610			↓	38-42'	1						✓								
64413	↓	1610			↓	38-42'	1	✓													
64414	↓	1610			↓	38-42'	1		✓	✓	✓										
64415	↓	1610			↓	38-42'	1						✓								

Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
BRADLEY J. NORTON											
(Printed)				(Printed)		(Printed)				(Printed)	
BRADLEY J. NORTON											
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 of 54			
(Printed)				(Printed)							

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME		PARAMETERS										INDUSTRIAL HYGIENE SAMPLE			
5380.001.01		YORKTOWN NAVAL WEAPONS STATION BLDG 5												Y N			
SAMPLERS: (Signature)				(Printed)				REMARKS									
Bradley J. Norton				BRADLEY J. NORTON													
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	BTEX (8020)	TPH (418.1)	TOTAL HAPs	PCB (8080)	TECP METALS						
64416	11/15	1045			BH-4 8-10'	1	✓										
64417		1045			BH-4 8-10'	1		✓	✓	✓							
64418		1045			BH-4 8-10'	1				✓							
64419		1245			BH-4 38-42'	1	✓										
64420		1245			BH-4 38-42'	1		✓	✓	✓							
64421		1245			BH-4 38-42'	1				✓							
64422		1245			BH-4 38-42'	1	✓										
64423		1245			BH-4 38-42'	1		✓	✓	✓							
64424		1245			BH-4 38-42'	1				✓							
64425		1530			BH-5 14-16'	1	✓						HOLD				
64426		1530			BH-5 14-16'	1		✓	✓	✓			HOLD				
64427	✓	1530			BH-5 14-16'	1				✓			HOLD				
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)							
Bradley J. Norton				BRADLEY J. NORTON													
(Printed)				(Printed)		(Printed)				(Printed)							
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks 12 OF 54									
(Printed)				(Printed)													

CHAIN OF CUSTODY RECORD

[illegible]

COMPANY: VERSAR INC.
LAB #: 4264-41234
MATRIX: WATER

DATE RECEIVED: 11/30/91
DATE EXTRACTED: NA
DATE ANALYZED: 12/ 9/91

SAMPLE ID: 64472 EQUIPMENT BLANK 11-27-91

AROMATIC VOLATILE COMPOUNDS — METHOD 602

PARAMETER	RESULT (ug/l)	DETECTION LIMIT
Benzene	ND	1.0
Toluene	ND	1.0
Ethylbenzene	ND	1.0
Xylenes	ND	1.0

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	86

COMPANY: VERSAR INC.
LAB #: 4264-41233
MATRIX: WATER

DATE RECEIVED: 11/30/91
DATE EXTRACTED: NA
DATE ANALYZED: 12/ 9/91

SAMPLE ID: 64464 MW-4 11-27-91

AROMATIC VOLATILE COMPOUNDS — METHOD 602

PARAMETER	RESULT (ug/l)	DETECTION LIMIT
Benzene	ND	1.0
Toluene	ND	1.0
Ethylbenzene	1.2	1.0
Xylenes	2.2	1.0

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Trifluorotoluene	(67-130)	(59-136)	Interference

CHAIN OF CUSTODY RECORD

[illegible]

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME						PARAMETERS								INDUSTRIAL HYGIENE SAMPLE		<div><div></div><div>Y N</div></div>							
SAMPLERS: (Signature)							(Printed)																		
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPT	BTEX	VOC	SOLVENT	PETROLEUM HCS	MERCURY	CADMIUM	LEAD	COPPER	ZINC	NICKEL	CHROMIUM VI	ARSENIC	SILICA	DUST / FOG	REMARKS			
64472	1/27			X	Eggs Blank	2	X																		
64471				X	A/W-6	1	X																		
10					A/W-6	2	X																		
69					A/W-5	1	X																		
68					A/W-5	2	X																		
67					A/W-4B	1	X																		
66					A/W-4B	2	X																		
64					A/W-4	2	X																		
65					A/W-4	1	X																		
Relinquished by: (Signature) <i>Lauren Matthews</i>			Date / Time <i>1/27/11 1600</i>		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)												
(Printed) <i>Lauren Matthews</i>					(Printed)			(Printed)					(Printed)												
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature) <i>Theresa M. Baird</i>			Date / Time <i>1/27/11 1600</i>		Remarks <i>Preserved w/HCL to pH < 2</i> <i>Results as soon as possible please</i>															
(Printed)					(Printed) <i>Theresa M. Baird</i>																				

ANALYSIS REPORT
General Inorganic Chemistry Section

DATE: 06-DEC-91

PAGE: 1

CODE / CONTROL #: VERSYOR / 5890

CLIENT / SITE: VERSAR DIV. 61 / YORKTOWN

PROJECT / BATCH: 420.1.0 / 3

Lab#	Field #	TRPH (mg/L)		
68148	64471	0.26		
68149	64469	0.34		
68150	64467	0.28		
68151	64465	0.40		

C. Thomas
Laboratory Manager

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME		PARAMETERS										INDUSTRIAL HYGIENE SAMPLE	
SAMPLERS: (Signature)		(Printed)		REMARKS											
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH	BTEX							
64472	1/27			X	Equip Blank	2	X								
64471				X	MW-6	1	X								
10					MW-6	2	X								
69					MW-5	1	X								
68					MW-5	2	X								
67					MW-4B	1	X								
66					MW-4B	2	X								
64					MW-4	2	X								
65					MW-4	1	X								
<div> <div>Relinquished by: (Signature)</div> <div>Lauren Matthews</div> <div>(Printed)</div> </div> <div> <div>Date / Time</div> <div>1/27/11 1600</div> </div> <div> <div>Received by: (Signature)</div> <div></div> <div>(Printed)</div> </div> <div> <div>Relinquished by: (Signature)</div> <div></div> <div>(Printed)</div> </div> <div> <div>Date / Time</div> <div></div> </div> <div> <div>Received by: (Signature)</div> <div></div> <div>(Printed)</div> </div>															
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